

Daily report

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Analysis and prediction of COVID-19 for EU-EFTA-UK and other countries

Situation report 125

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Foreword

The present report aims to provide a comprehensive picture of the **pandemic situation of COVID-19** in the EU countries, and to be able to foresee the situation in the next coming days. We provide some figures and tables with several **indexes and indicators** as well as an **Analysis** section that discusses a specific topic related with the pandemic.

As for the predictions, we employ an **empirical model**, verified with the evolution of the number of confirmed cases in previous countries where the epidemic is close to conclude, including all provinces of China. The model does not pretend to interpret the causes of the evolution of the cases but to permit the **evaluation of the quality of control measures made in each state** and a **short-term prediction of trends**. Note, however, that the effects of the measures' control that start on a given day are not observed until approximately 7-14 days later.

We show an individual report with 8 graphs and a summary table with the main indicators for different countries and regions. We are adjusting the model to **countries and regions** with at least 4 days with more than 100 confirmed cases and a current load over 200 cases.

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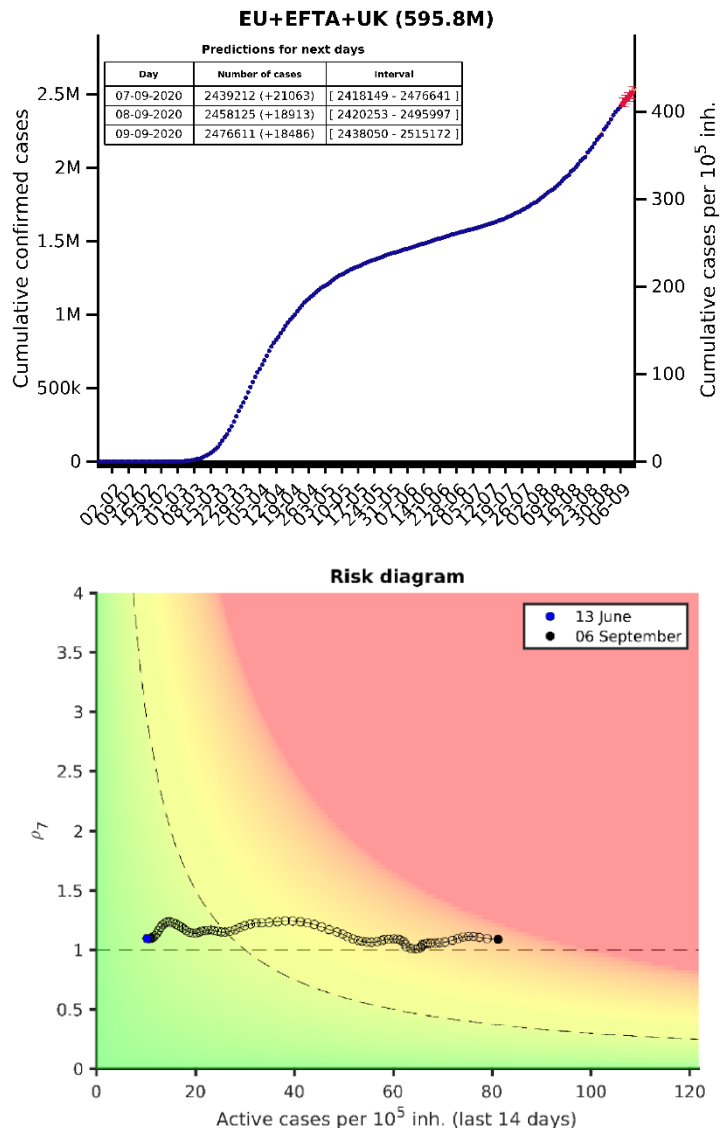
Situation and highlights

The important news today is far from Europe. With the latest ECDC data, India has now overtaken Brazil, with more than 4 million 200 thousand cases currently registered, in an immense country with a high population density and health services with certain shortcomings. The pandemic is not only affecting cities, it is currently wreaking havoc in remote areas as well. A country with a significant part of the population living in poverty and extreme poverty, affected by other diseases such as tuberculosis, is clearly a place with very complex prospects. Despite the magnitude of people affected, the number of deaths recorded is much lower than in Brazil, the register is likely to present some problems.

They are not yet in the red zone, but the growth is very fast. They are reporting more than 90,000 cases every day, a value that is still growing. Given the size of the country's population, such proximity to the red zone denotes that there are regions with a huge incidence, and that number of people affected can still grow significantly.

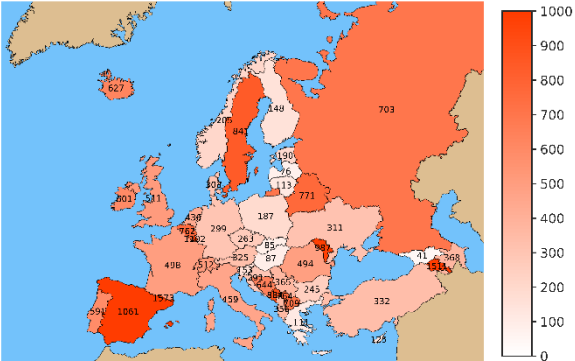
India's situation affects the world globally. Despite having a population living in poverty, the country as a whole is an economic giant with many international relations.

If we look at the risk diagrams of the EU+EFTA+UK countries, the strong growth in UK, France, the Netherlands, Czech Republic and Hungary is worrying.



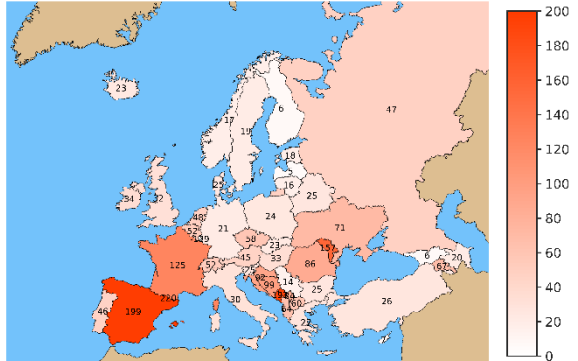
- Cumulative incidence: total number of reported cases per 100,000 inhabitants
- A_{14} : Cumulative incidence last 14 days per 100,000 inhabitants (active cases)
- ρ_7 : Empiric reproduction number
- EPG: Effective Potential Growth ($EPG = A_{14} \cdot \rho_7$)

Cumulative incidence



ρ_z

A



E

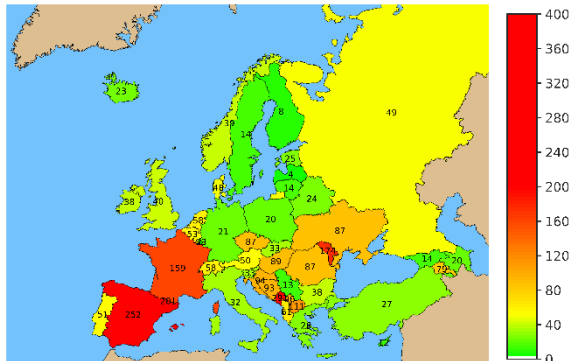
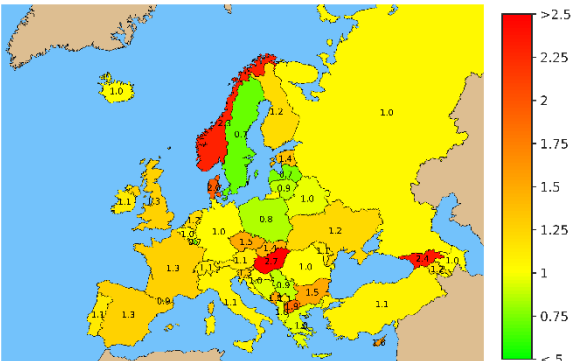


Table of current situation in EU countries. Colour scale is indicated in each legend.

Country	Reported data						Indexes		
	Cumulative cases	Attack rate /10 ⁵ inh.	Cumulative deaths	Mortality /10 ⁵ inh.	Active cases (last 14 days)	14-day attack rate /10 ⁵ inh.	$\rho_7^{(1)}$	EPG ⁽²⁾	Biocom-Cov degree
Spain	488,513	1,054.0	29,234	63.1	110,607	238.6	1.08	257	9
United Kingdom	340,411	512.4	41,527	62.5	18,131	27.3	1.19	33	4
France	300,181	463.8	30,706	47.4	70,367	108.7	1.30	141	7
Italy	272,912	459.2	35,507	59.7	16,794	28.3	1.11	31	4
Germany	246,948	301.5	9,319	11.4	16,000	19.5	0.98	19	3
Romania	91,256	461.4	3,765	19.0	16,293	82.4	1.03	85	7
Belgium	86,450	761.1	9,899	87.2	5,000	44.0	0.91	40	4
Sweden	84,729	861.2	5,832	59.3	2,213	22.5	0.84	19	3
Netherlands	72,392	426.2	6,226	36.7	7,400	43.6	1.07	46	5
Poland	69,129	180.9	2,092	5.5	9,751	25.5	0.91	23	4
Portugal	59,051	569.3	1,829	17.6	4,059	39.1	1.49	58	5
Switzerland	43,127	503.2	1,730	20.2	4,201	49.0	1.12	55	6
Ireland	29,206	618.0	1,777	37.6	1,530	32.4	0.98	32	4
Austria	28,495	327.1	735	8.4	3,887	44.6	1.13	50	5
Czech Republic	26,452	249.3	426	4.0	5,407	51.0	1.30	66	6
Denmark	17,374	304.2	626	11.0	1,318	23.1	1.56	36	4
Bulgaria	16,617	233.0	648	9.1	1,655	23.2	0.84	20	3
Croatia	11,094	263.3	194	4.6	3,765	89.4	1.02	91	7
Norway	11,035	205.6	264	4.9	873	16.3	1.92	31	4
Greece	10,998	98.3	278	2.5	3,064	27.4	0.93	25	4
Finland	8,200	149.0	335	6.1	358	6.5	1.23	8	2
Hungary	6,923	71.0	620	6.4	1,877	19.2	3.42	66	5
Luxembourg	6,745	1,171.0	124	21.5	NA	NA	NA	NA	NA
Slovakia	4,163	76.5	37	0.7	1,061	19.5	1.09	21	3
Slovenia	3,041	146.3	129	6.2	505	24.3	1.24	30	4
Lithuania	2,978	102.4	86	3.0	450	15.5	0.95	15	3
Estonia	2,444	186.3	64	4.9	217	16.5	1.15	19	3
Iceland	2,128	584.2	10	2.7	88	24.2	0.94	23	4
Malta	1,965	458.0	13	3.0	456	106.3	NA	NA	6
Cyprus	1,498	128.0	21	1.8	103	8.8	0.99	9	2
Latvia	1,410	71.5	34	1.7	83	4.2	1.67	7	2
Liechtenstein	108	280.1	1	2.6	8	20.7	NA	NA	1

Colour scale							
Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>100
Best	Best	Best	Best	Best	Best	0.0	0

⁽¹⁾ ρ_7 is the average of 7 consecutive ρ , but can still fluctuate. ⁽²⁾ EPG_{REP} stands for Effective Growth Potential, which is the product of reported cumulative incidence of last 14 days per 10⁵ inhabitants by ρ_7 (empiric reproduction number). Biocom-Cov degree is an epidemiological situation scale based on the level of last week's mean daily new cases (<https://upcommons.upc.edu/handle/2117/189661>, <https://upcommons.upc.edu/handle/2117/189808>).

Analysis: Re-opening schools in times of pandemics. Schools as a reflection of the community.

One of the first widespread measures against the uncontrolled spreading of Covid-19 was the closure of schools. The absence of certainty about the Covid-19 transmission capacity of children was replaced by the simplest assumption: children are typically good spreaders of the flu-like virus; therefore, they can also be important spreaders of the new disease. Six months after, there are pieces of evidence that children can be infected at more or less similar levels as adults, but that they do not have shown a relevant super-spreading role. Children's transmission capacity is still under study. Results published till now suggest that children could have a slightly lower transmission capacity than adults, but that teenagers would be as infectious as adults. This is the working framework used by many countries that are re-opening schools these weeks.

Spain is leading the second wave in Europe, with a current A14 of 238 cases per 100,000 inhabitants (14-day cumulative incidence) and an empiric reproduction number of 1.1. At the same time, between this and next week the primary and secondary schools (3-11 and 12-17 years old, respectively) are being re-opened after six months of closure. The planning of the new academic course was carried out in June – early July when incidence was still low in most of the Spanish regions. Several modifications to the re-opening protocols have been incorporated during the last 2 months in order to adapt them to a worsening situation.

Specific measures have been designed by regional governments since Education competencies belong to the Autonomous Communities. Therefore, there are some differences between them. In general terms, measures designed can be summarized in 3 points:

- **Prevention of transmission** by use of masks (either compulsory or depending on the neighborhood incidence, region, and age of children), frequent hands washing, distance, opened windows, frequent ventilation, and increasing outdoor activities, among others.
- **Children within bubble-groups** trying to eliminate any contact between children in different groups, making them also **as small as possible**. Typically, in the absence of Covid-19, primary-school groups are composed of around 25 children and secondary-school groups have around 30-35 teenagers, at most.
- **14-day quarantine of bubble-groups** when a PCR+ is detected, either in a student or a teacher. If 2 or more PCR+ were detected, the quarantine could be applied to the whole school, after an analysis from public health experts.

With regards to the re-opening of schools, we can set out two questions:

- How many community-infected children, teenagers and teachers (index cases) can we have inside schools?
- How many secondary infections can we expect from these primary cases?

In this analysis, we are going to deal with the first question. Recent studies in Spain suggest that incidence in summer camps (school-like environment) is similar to that of their surrounding areas¹. This hypothesis is also acceptable in schools, since they are not closed and isolated systems but they are open to the community.

With this hypothesis in mind, we can assume that the fraction of cases detected among the scholar community will be similar to that of the cases detected among the neighboring community, **if no specific mass screening protocols are implemented**. Therefore, we can evaluate the expected number of detected

¹ <https://www.sjdhospitalbarcelona.org/en/kidscorona/children-spreaders-disease>

PCR+ inside the schools in a certain period. In addition, we can assess the consequent number of bubble-groups and students that will undergo a quarantine, as close-contacts of those index cases.

Case study: Catalunya

As an example, we are going to evaluate the expected number of PCR+ found among children and teenagers in Catalan schools the next 2 weeks. This Spanish autonomous community, with a population of around 7.5 M inhabitants, has spent 7 weeks with a quite constant incidence (around 1,000 daily new cases, on average). It currently has a 14-day cumulative incidence of $A_{14} = 194/10^5$ inh. This incidence is similar to that of the 10-19 years old population ($A_{14} = 193/10^5$ inh), while the 0-9 years old group presents a slightly lower incidence ($A_{14} = 139/10^5$ inh)². With these incidences in mind, we can roughly estimate the number of PCR+ and quarantines to be expected the next 2 weeks.

Expected cases and quarantines in primary schools

According to official data, last academic course (2019-2020) there were 693,310 children in the range 3-11 years old³. They were attending 2304 primary schools. Therefore, there are 300 children per school, on average. Catalan primary schools have been requested to organize children in bubble-groups of 20 students at most, and the minimum number of teachers per group. The mean 14-day diagnosed incidence in 3-11 years old population is around 150 PCR+ per 100,000 children. We can assume that, on average, this incidence will be present in schools as well. If schools are organized in **bubble-groups of 20 children and 3 teachers**, we can estimate the **probability that a PCR+ is diagnosed inside this group during the next 2 weeks**:

$$Probability \approx \frac{150}{100,000} \cdot (20 + 3) = 0.035 = 3.5\%$$

If this school has 300 children (i.e., 15 groups of 20 children and 3 teachers), the probability that **a PCR+ is diagnosed among this school's community during the next 2 weeks will be**:

$$Probability \approx 0.035 \cdot 15 = 0.5 = 50\%$$

This means that, on average, we will find one PCR+ among two schools, i.e., one bubble-group among two schools will be closed for a 14-day quarantine period. The global number of quarantined groups the first two weeks would be around 1190, while the number of quarantined students would be around 23,900, which represent a 3.5 % of children in Catalan primary schools.

Expected cases and quarantines in secondary schools

We can apply the same methodology to assess the expected number of PCR+ and quarantines among Catalan secondary schools for the next two weeks. Last academic course, there were 544,946 students (12-17 years old) in secondary schools with an average of 500 students per center⁴. Current incidence among in this age group is around $200/10^5$. The number of teachers that enter the classroom is higher. Let us assume bubble groups of 25 students with around 8 adults entering the class. The estimates will be:

$$Probability \text{ of a case inside a group} = 0.066 = 6.6\%$$

$$Mean \text{ number of groups with a positive in a school} = 1.3$$

$$Mean \text{ number of students in quarantine} = 35,966$$

² <https://dadescovid.cat/descarregues?lang=eng>

³ <http://ensenyament.gencat.cat/ca/departament/>

⁴ <https://www.idescat.cat/pub/?id=aec&n=3>

The number of students in quarantine represents 6.6 % of the total number of students in secondary schools, which is higher than in the case of primary schools. We can evaluate the maximum size of the group as a function of the surrounding incidence, fixing 5% as the maximum allowed percentage of students in quarantine (Figure 1).

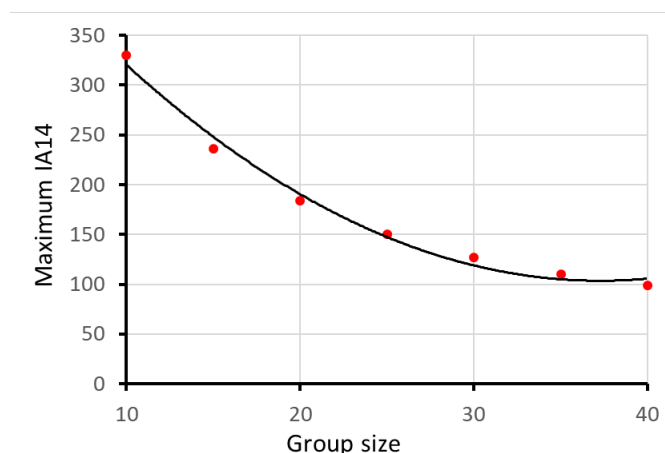


Figure 1. Maximum 14-day incidence to ensure a maximum of 5% students in quarantine as a function of the group size in secondary schools.

Discussion

The estimations discussed in this analysis have been carried out by **assuming a homogeneous incidence inside Catalunya and a typical school of 300-500 students**. Nevertheless, **reality is much more diverse and heterogeneous**. The same methodology can be applied to estimate the number of expected PCR+ and consequent quarantines in particular neighborhoods and at any other moment of the epidemic. At the end of this section, **we include a set of tables with the expected results depending on the 14-day cumulative incidence and the size of the groups**. In addition, the implementation of mass screening in schools can increase the percentage of diagnosis among children. In that case, the number of positives and quarantines would increase accordingly.

Given the current epidemiological situation, the number of groups and students that will have to undergo a quarantine the following weeks is not insignificant at all. Nevertheless, **closure of bubble-groups will be the symptom of a good detection and control**, since it will prevent the appearance of secondary cases inside the schools. These quarantines are the way to guarantee that the schools can keep working, but they have two important derivatives: on the one hand, online academic activities for children and teenagers that will spend 2 weeks at home must be guaranteed as well; on the other hand, the possibility that parents will be able to take care of their children during these quarantines must be guaranteed as well.

Supplementary tables

Expected cases and quarantines in primary schools

Considering 693,310 children in primary schools of 300 students (3-11 years old).

		Probability of detecting a PCR+ in a bubble-group						
Adults in the group		1	2	3	4	5	6	7
Group size		10	15	20	25	30	35	40
A ₁₄	30	0,3%	0,5%	0,7%	0,9%	1,1%	1,2%	1,4%
	70	0,8%	1,2%	1,6%	2,0%	2,5%	2,9%	3,3%
	100	1,1%	1,7%	2,3%	2,9%	3,5%	4,1%	4,7%
	150	1,7%	2,6%	3,5%	4,4%	5,3%	6,2%	7,1%
	200	2,2%	3,4%	4,6%	5,8%	7,0%	8,2%	9,4%
	300	3,3%	5,1%	6,9%	8,7%	10,5%	12,3%	14,1%

		Number of bubble-groups with a PCR+ detected in a school						
Group size		10	15	20	25	30	35	40
A ₁₄	30	0,1	0,1	0,1	0,1	0,1	0,1	0,1
	70	0,2	0,2	0,2	0,2	0,2	0,2	0,2
	100	0,3	0,3	0,3	0,3	0,4	0,4	0,4
	150	0,5	0,5	0,5	0,5	0,5	0,5	0,5
	200	0,7	0,7	0,7	0,7	0,7	0,7	0,7
	300	1,0	1,0	1,0	1,0	1,1	1,1	1,1

		Number of students in quarantine						
Group size		10	15	20	25	30	35	40
A ₁₄	30	2288	3536	4784	6032	7280	8528	9776
	70	5338	8250	11162	14074	16986	19898	22810
	100	7626	11786	15946	20106	24266	28426	32586
	150	11440	17679	23919	30159	36399	42639	48878
	200	15253	23573	31892	40212	48532	56851	65171
	300	22879	35359	47838	60318	72798	85277	97757

		Number of groups in quarantine						
Group size		10	15	20	25	30	35	40
A ₁₄	30	229	236	239	241	243	244	244
	70	534	550	558	563	566	569	570
	100	763	786	797	804	809	812	815
	150	1144	1179	1196	1206	1213	1218	1222
	200	1525	1572	1595	1608	1618	1624	1629
	300	2288	2357	2392	2413	2427	2436	2444

		Percentage of students in quarantine						
Group size		10	15	20	25	30	35	40
A ₁₄	30	0,3%	0,5%	0,7%	0,9%	1,1%	1,2%	1,4%
	70	0,8%	1,2%	1,6%	2,0%	2,5%	2,9%	3,3%
	100	1,1%	1,7%	2,3%	2,9%	3,5%	4,1%	4,7%
	150	1,7%	2,6%	3,5%	4,4%	5,3%	6,2%	7,1%
	200	2,2%	3,4%	4,6%	5,8%	7,0%	8,2%	9,4%
	300	3,3%	5,1%	6,9%	8,7%	10,5%	12,3%	14,1%

Expected cases and quarantines in secondary schools

Considering 544,946 teenagers in secondary schools of 500 students (12-17 years old).

		Probability of detecting a PCR+ in a bubble-group						
Adults in the group		5	6	7	8	9	10	10
Group size		10	15	20	25	30	35	40
A ₁₄	30	0,5%	0,6%	0,8%	1,0%	1,2%	1,4%	1,5%
	70	1,1%	1,5%	1,9%	2,3%	2,7%	3,2%	3,5%
	100	1,5%	2,1%	2,7%	3,3%	3,9%	4,5%	5,0%
	150	2,3%	3,2%	4,1%	5,0%	5,9%	6,8%	7,5%
	200	3,0%	4,2%	5,4%	6,6%	7,8%	9,0%	10,0%
	300	4,5%	6,3%	8,1%	9,9%	11,7%	13,5%	15,0%

		Number of bubble-groups with a PCR+ detected in a school						
Group size		10	15	20	25	30	35	40
A ₁₄	30	0,2	0,2	0,2	0,2	0,2	0,2	0,2
	70	0,5	0,5	0,5	0,5	0,5	0,5	0,4
	100	0,8	0,7	0,7	0,7	0,7	0,6	0,6
	150	1,1	1,1	1,0	1,0	1,0	1,0	0,9
	200	1,5	1,4	1,4	1,3	1,3	1,3	1,3
	300	2,3	2,1	2,0	2,0	2,0	1,9	1,9

		Number of students in quarantine						
Group size		10	15	20	25	30	35	40
A ₁₄	30	2452	3433	4414	5395	6376	7357	8174
	70	5722	8011	10299	12588	14877	17166	19073
	100	8174	11444	14714	17983	21253	24523	27247
	150	12261	17166	22070	26975	31879	36784	40871
	200	16348	22888	29427	35966	42506	49045	54495
	300	24523	34332	44141	53950	63759	73568	81742

		Number of groups in quarantine						
Group size		10	15	20	25	30	35	40
A ₁₄	30	245	229	221	216	213	210	204
	70	572	534	515	504	496	490	477
	100	817	763	736	719	708	701	681
	150	1226	1144	1104	1079	1063	1051	1022
	200	1635	1526	1471	1439	1417	1401	1362
	300	2452	2289	2207	2158	2125	2102	2044

		Percentage of students in quarantine						
Group size		10	15	20	25	30	35	40
A ₁₄	30	0,5%	0,6%	0,8%	1,0%	1,2%	1,4%	1,5%
	70	1,1%	1,5%	1,9%	2,3%	2,7%	3,2%	3,5%
	100	1,5%	2,1%	2,7%	3,3%	3,9%	4,5%	5,0%
	150	2,3%	3,2%	4,1%	5,0%	5,9%	6,8%	7,5%
	200	3,0%	4,2%	5,4%	6,6%	7,8%	9,0%	10,0%
	300	4,5%	6,3%	8,1%	9,9%	11,7%	13,5%	15,0%

Situation and trends in other countries

Table of current situation in other countries. Colour scale is indicated in each legend.

Country	Reported data						Indexes		
	Cumulative cases	Attack rate /10 ⁵ inh.	Cumulative deaths	Mortality /10 ⁵ inh.	Active cases (last 14 days)	14-day attack rate /10 ⁵ inh.	$\rho_7^{(1)}$	EPG ⁽²⁾	Biocom-Cov degree
United States of America	6,276,421	1,896.2	188,941	57.1	573,810	173.4	0.97	168	8
India	4,204,613	310.8	71,642	5.3	1,098,265	81.2	1.09	88	7
Brazil	4,137,521	1,946.5	126,650	59.6	531,738	250.2	1.04	259	9
Russia	1,025,505	702.7	17,820	12.2	68,756	47.1	1.04	49	5
Peru	689,977	2,092.6	29,838	90.5	95,651	290.1	0.89	258	9
Mexico	634,023	491.7	67,558	52.4	73,859	57.3	1.05	60	6
Argentina	471,793	1,043.9	9,807	21.7	135,004	298.7	1.08	323	9
Chile	422,510	2,210.2	11,592	60.6	24,845	130.0	1.03	134	8
Iran	386,658	460.3	22,293	26.5	27,753	33.0	0.90	30	4
Saudi Arabia	320,827	921.5	4,081	11.7	13,348	38.3	0.85	33	5
Pakistan	298,903	135.3	6,345	2.9	6,138	2.8	1.24	3	2
Canada	131,895	349.5	9,145	24.2	6,999	18.5	1.22	23	3
Qatar	120,095	4,168.4	203	7.0	3,087	107.1	0.98	105	7
Ecuador	118,045	669.1	10,524	59.6	10,276	58.2	0.96	56	6
Belarus	72,859	771.1	711	7.5	2,391	25.3	0.96	24	4

Colour scale							
Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>100
Best	Best	Best	Best	Best	Best	0.0	0

⁽¹⁾ ρ_7 is the average of 7 consecutive ρ , but can still fluctuate. ⁽²⁾ EPG_{REP} stands for Effective Growth Potential, which is the product of reported cumulative incidence of last 14 days per 10⁵ inhabitants by ρ_7 (empiric reproduction number). Biocom-Cov degree is an epidemiological situation scale based on the level of last week's mean daily new cases (<https://upcommons.upc.edu/handle/2117/189661>, <https://upcommons.upc.edu/handle/2117/189808>).

Situation and trends in some European regions

Table of current situation in Switzerland. Colour scale is indicated in each legend.

Country	Reported data						Indexes		
	Cumulative cases	Attack rate /10 ⁵ inh.	Cumulative deaths	Mortality /10 ⁵ inh.	Active cases (last 14 days)	14-day attack rate /10 ⁵ inh.	$\rho_7^{(1)}$	EPG ⁽²⁾	Biocom-Cov degree
Vaud	7,380	923.7	432	54.1	626	78.3	0.42	33	5
Geneva	6,741	1,348.2	297	59.4	35	7.0	NA	NA	0
Zurich	6,513	1,596.3	142	34.8	934	228.9	0.94	216	9
Ticino	3,561	1,008.8	350	99.2	49	13.9	0.85	12	3
Bern	2,681	259.0	99	9.6	272	26.3	1.15	30	5
Valais	2,371	683.3	155	44.7	53	15.3	0.05	1	0
Fribourg	1,898	4,866.7	87	223.1	337	864.1	1.47	1,266	9
Basel City	1,247	674.1	54	29.2	62	33.5	0.87	29	5
Aargau	1,231	181.6	46	6.8	0	0.0	NA	NA	0
Lucerne	1,092	1,348.1	21	25.9	79	97.5	0.81	79	7
Basel Country	1,059	376.9	35	12.5	50	17.8	0.64	11	3
Graubünden	1,022	516.2	50	25.3	40	20.2	1.28	26	4
Neuchâtel	901	509.0	84	47.5	51	28.8	0.99	28	5
St. Gallen	825	159.3	38	7.3	0	0.0	NA	NA	0
Solothurn	731	292.4	18	7.2	80	32.0	0.63	20	4
Thurgau	592	214.5	19	6.9	33	12.0	0.77	9	3
Schwyz	508	332.0	25	16.3	44	28.8	0.84	24	4
Zug	377	314.2	9	7.5	43	35.8	1.86	67	6
Jura	274	375.3	7	9.6	8	11.0	1.50	16	3
Schaffhausen	168	227.0	9	12.2	7	9.5	1.40	13	3
Glarus	166	415.0	13	32.5	5	12.5	0.73	9	3
Uri	137	1,522.2	7	77.8	5	55.6	0.00	0	0
Appenzell Ausserrhoden	135	245.5	3	5.5	5	9.1	0.89	8	3
Nidwalden	134	311.6	3	7.0	3	7.0	0.60	4	2
Liechtenstein	107	274.4	1	2.6	7	17.9	0.00	0	0
Obwalden	60	157.9	0	0.0	0	0.0	NA	NA	0
Appenzell Innerrhoden	25	156.3	0	0.0	0	0.0	NA	NA	0

Colour scale							
Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>100
Best	Best	Best	Best	Best	Best	0.0	0

Table of current situation in Germany. Colour scale is indicated in each legend.

Country	Reported data						Indexes		
	Cumulative cases	Attack rate /10 ⁵ inh.	Cumulative deaths	Mortality /10 ⁵ inh.	Active cases (last 14 days)	14-day attack rate /10 ⁵ inh.	$\rho_7^{(1)}$	EPG ⁽²⁾	Biocom-Cov degree
Nordrhein-Westfalen	60,433	337.0	1,823	10.2	3,517	19.6	0.96	19	4
Bayern	59,298	453.3	2,642	20.2	4,237	32.4	0.92	30	5
Baden-Württemberg	43,592	393.8	1,865	16.8	3,419	30.9	0.96	30	5
Niedersachsen	17,284	216.5	665	8.3	1,188	14.9	0.90	13	3
Hessen	16,145	257.7	535	8.5	1,488	23.7	0.92	22	4
Berlin	11,727	311.1	226	6.0	999	26.5	1.08	29	5
Rheinland-Pfalz	9,364	229.2	243	5.9	697	17.1	0.85	14	3
Hamburg	6,486	341.5	267	14.1	432	22.7	1.30	30	4
Sachsen	6,149	150.9	225	5.5	325	8.0	1.26	10	3
Schleswig Holstein	4,126	142.8	161	5.6	222	7.7	0.85	7	2
Brandenburg	3,931	156.0	169	6.7	144	5.7	0.81	5	2
Thüringen	3,690	172.7	186	8.7	137	6.4	0.84	5	2
Saarland	3,199	323.1	174	17.6	123	12.4	0.71	9	3
Sachsen-Anhalt	2,282	103.4	66	3.0	102	4.6	0.87	4	2
Bremen	2,070	377.7	58	10.6	165	30.1	0.85	26	5
Mecklenburg-Vorpommern	1,023	63.5	20	1.2	29	1.8	1.39	3	2

Colour scale							
Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>100
Best	Best	Best	Best	Best	Best	0.0	0

Table of current situation in the Netherlands. Colour scale is indicated in each legend.

Country	Reported data						Indexes		
	Cumulative cases	Attack rate /10 ⁵ inh.	Cumulative deaths	Mortality /10 ⁵ inh.	Active cases (last 14 days)	14-day attack rate /10 ⁵ inh.	$\rho_7^{(1)}$	EPG ⁽²⁾	Biocom-Cov degree
South Holland	20,840	561.9	1,356	36.6	2,886	77.8	1.38	107	7
North Holland	13,571	475.7	832	29.2	2,184	76.6	1.24	95	7
North Brabant	12,853	505.0	1,554	61.1	1,063	41.8	0.91	38	7
Gelderland	7,861	379.4	692	33.4	556	26.8	1.03	28	4
Utrecht	5,862	448.5	437	33.4	668	51.1	1.34	68	6
Limburg	5,585	639.0	760	87.0	311	35.6	1.01	36	5
Overijssel	3,603	311.7	315	27.2	168	14.5	1.27	18	3
Flevoland	1,414	334.3	95	22.5	167	39.5	1.23	48	6
Zeeland	1,092	285.1	73	19.1	70	18.3	0.96	18	4
Friesland	848	130.9	69	10.6	62	9.6	0.82	8	3
Groningen	636	318.0	19	9.5	77	38.5	1.03	40	5
Drenthe	622	126.4	41	8.3	21	4.3	1.03	4	2

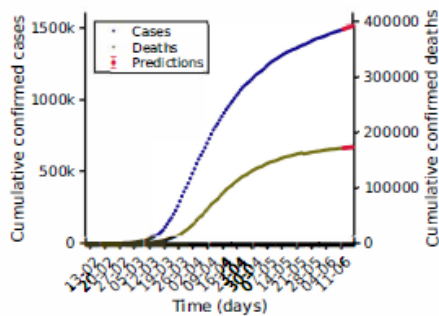
Colour scale							
Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>100
Best	Best	Best	Best	Best	Best	0.0	0

⁽¹⁾ ρ_7 is the average of 7 consecutive ρ , but can still fluctuate. ⁽²⁾ EPG_{REP} stands for Effective Growth Potential, which is the product of reported cumulative incidence of last 14 days per 10⁵ inhabitants by ρ_7 (empiric reproduction number). Biocom-Cov degree is an epidemiological situation scale based on the level of last week's mean daily new cases (<https://upcommons.upc.edu/handle/2117/189661>, <https://upcommons.upc.edu/handle/2117/189808>).

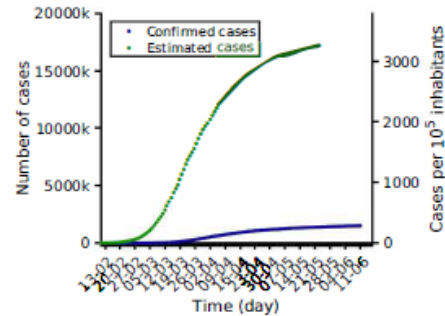
Legend: Countries' reports details

EU+EFTA+UK 11-06-2020. Population: 527.9M. Current cum. incidence: 283/10⁵

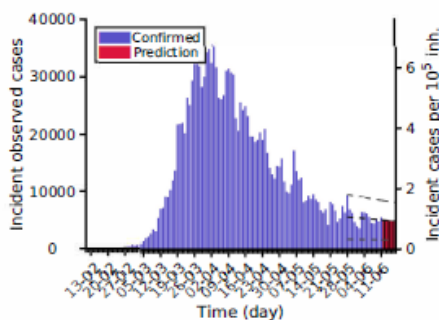
Reported cumulative cases (blue) and deaths (brown), together with predictions (red)



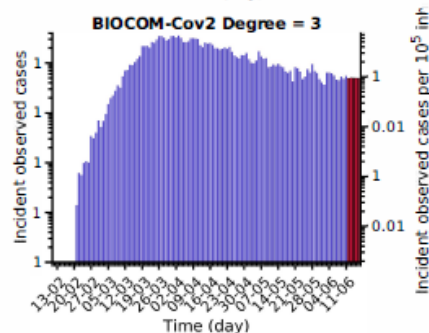
Estimated and reported cases.



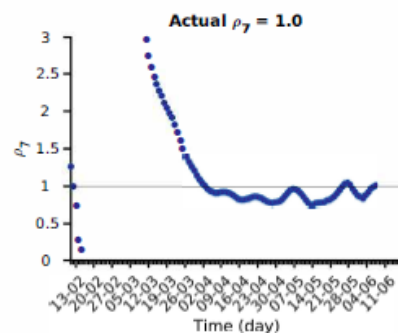
Incident observed cases and predictions.



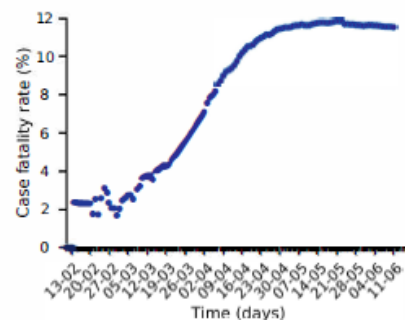
Incident observed cases in a logarithmic scale, with Biocom-Cov degree.



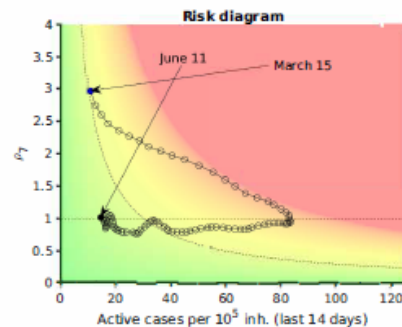
Evolution of empiric reproductive number ρ_7



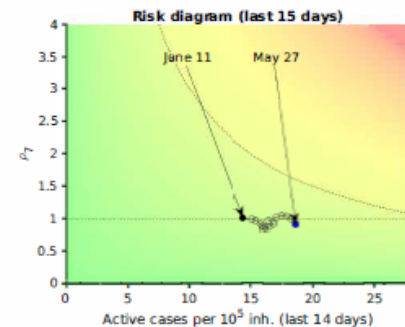
Case fatality rate



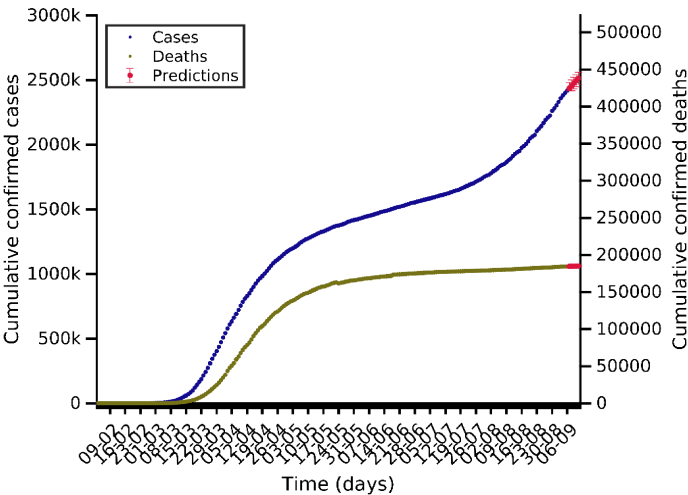
Risk diagram



Risk diagram of last 15 days

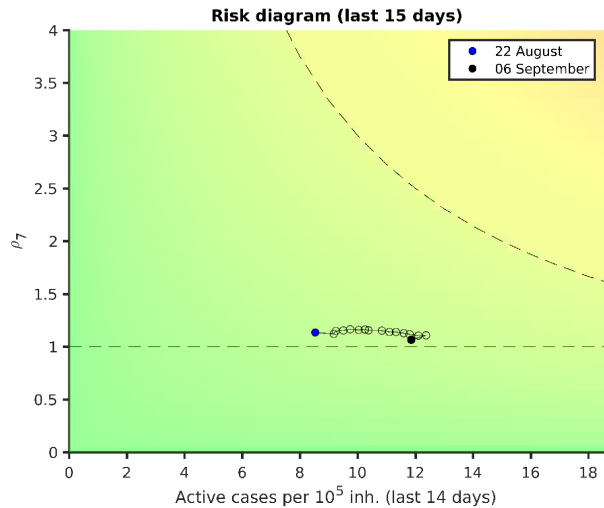
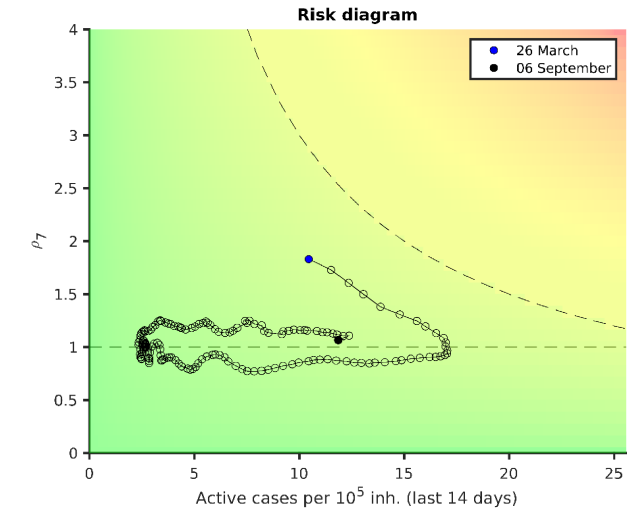
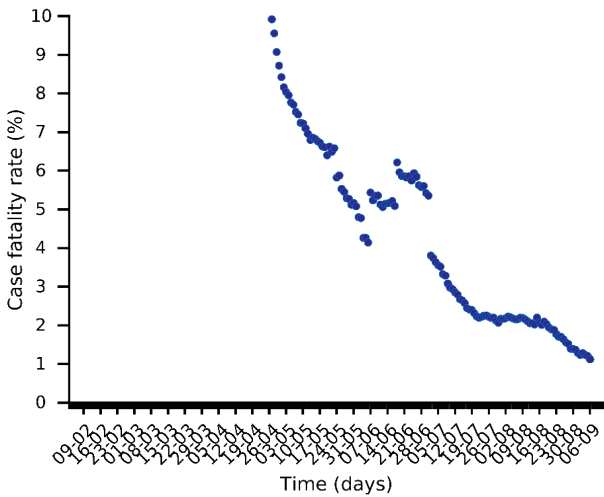
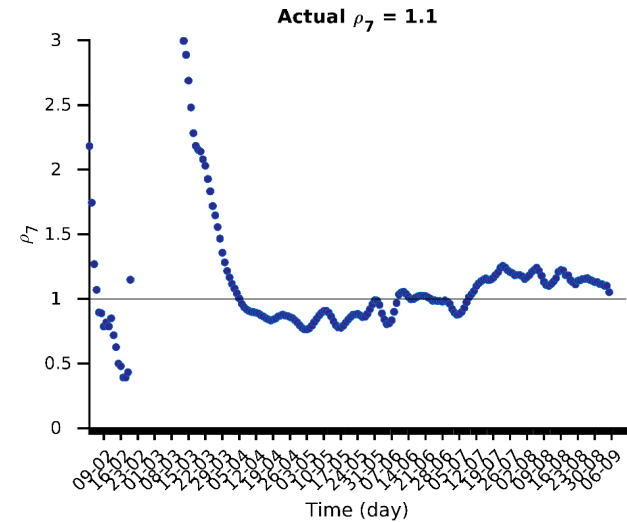
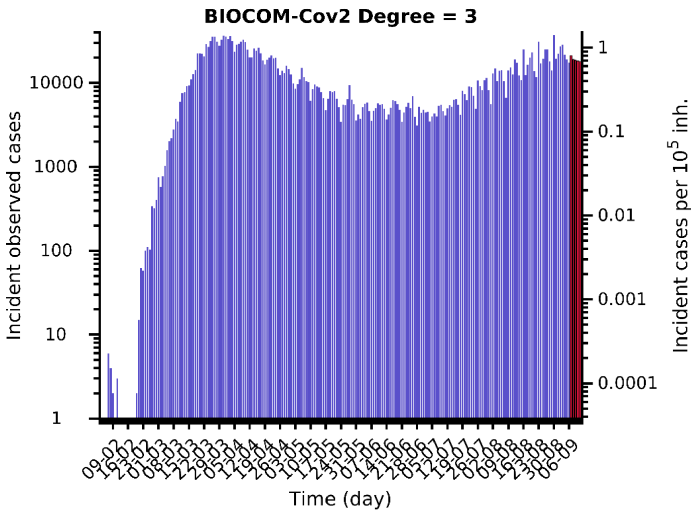
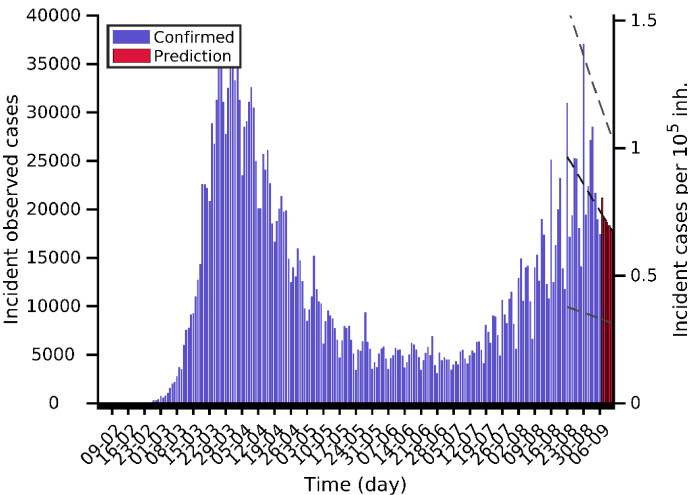


**(1) Analysis and prediction of COVID-19
for EU+EFTA+UK**

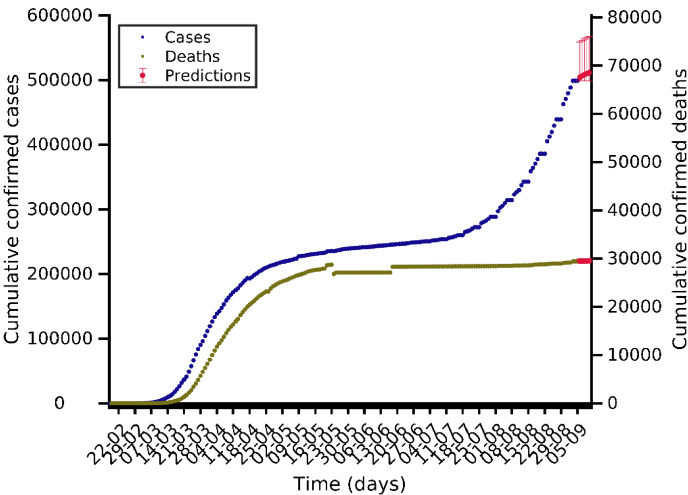


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	2439318 (+21169)	[2418149 - 2481828]
09-09-2020	2477042 (+18672)	[2433075 - 2521009]
11-09-2020	2513261 (+17923)	[2466358 - 2560165]

Current indicators		
A_{14}	EPG	CFR
12	12	1.12 %

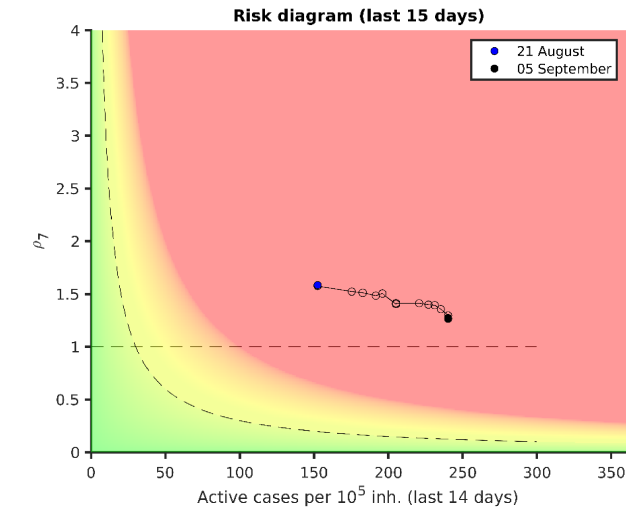
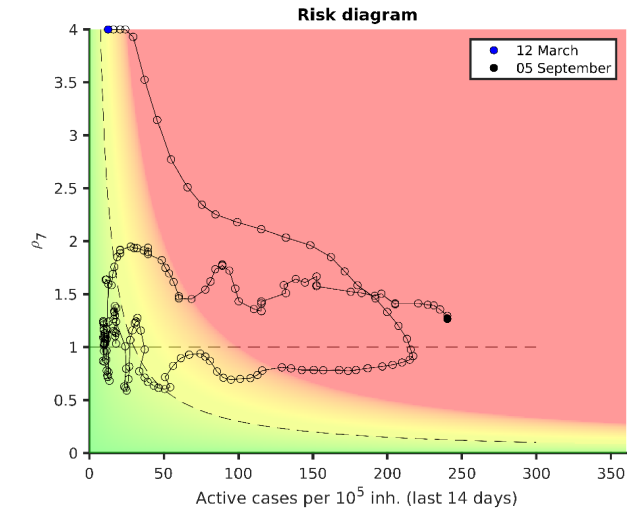
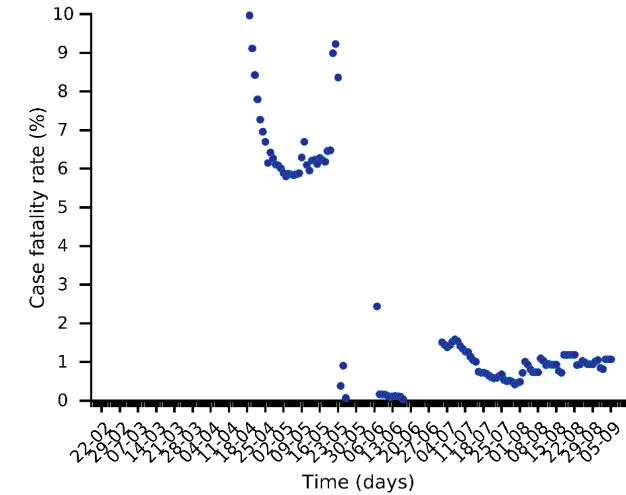
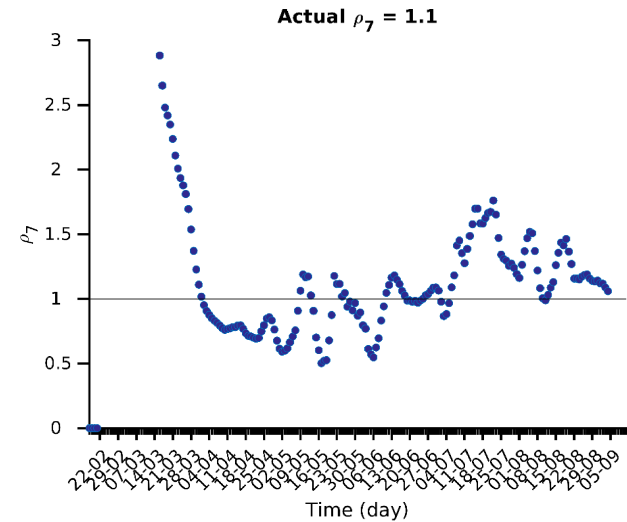
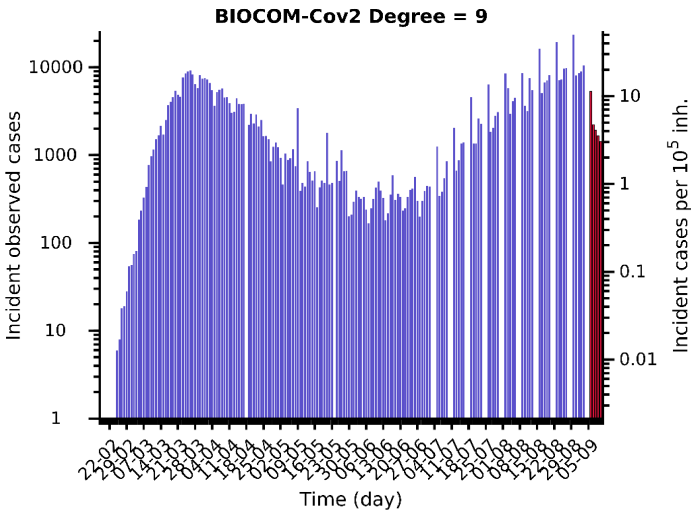
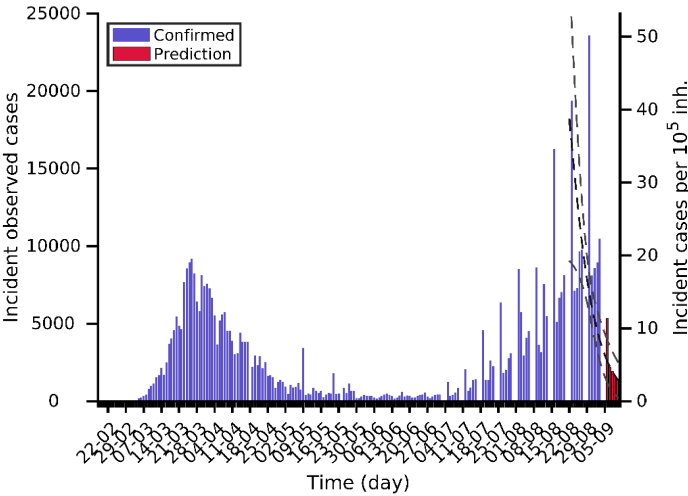


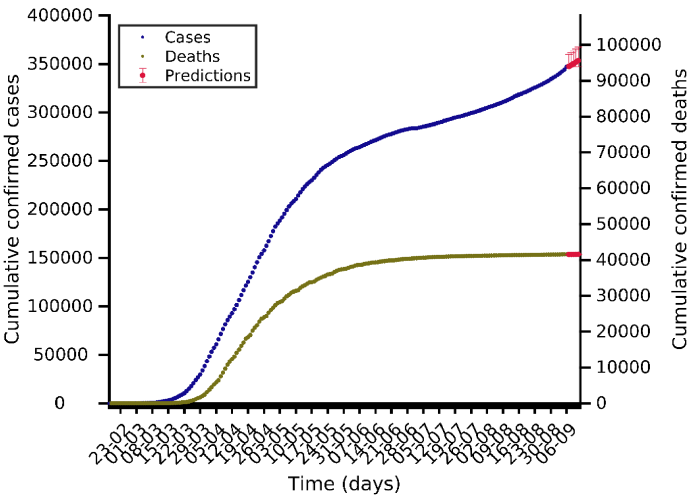
Spain 05-09-2020. Pop: 47.0M. Cumulative incidence: 1061/10⁵



Predictions for next days		
Day	Number of cases	95% Confidence Interval
06-09-2020	504334 (+5345)	[498989 - 558844]
08-09-2020	508468 (+1917)	[498989 - 563618]
10-09-2020	511553 (+1429)	[498989 - 567572]

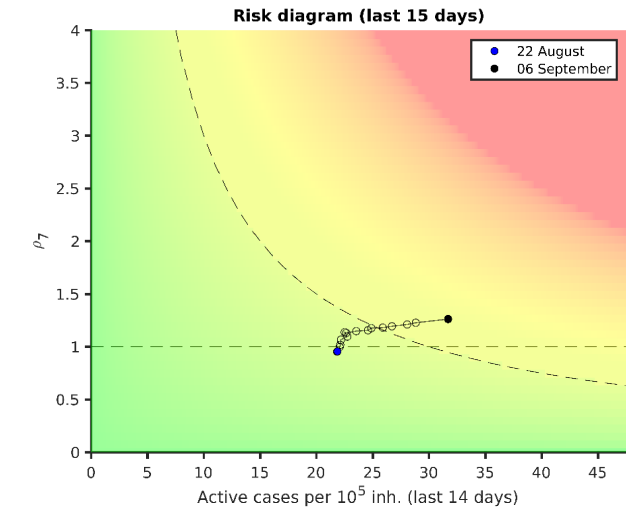
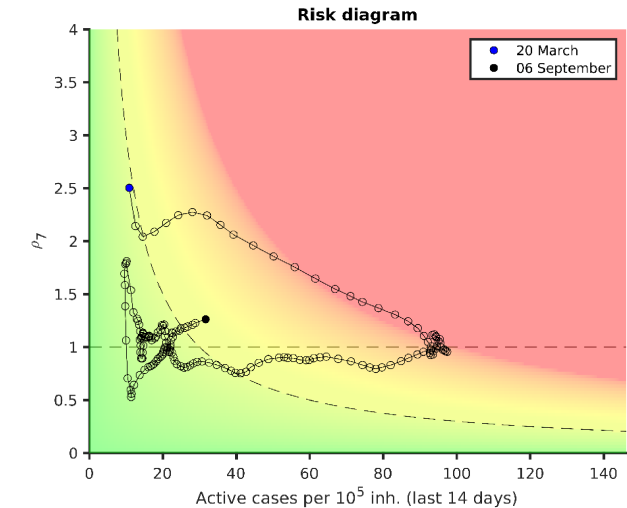
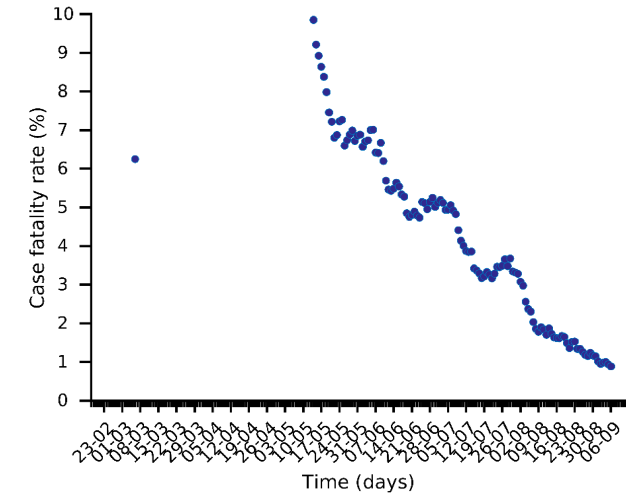
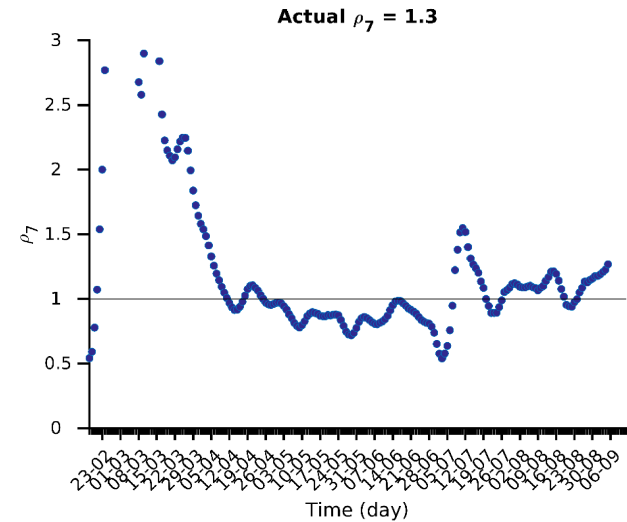
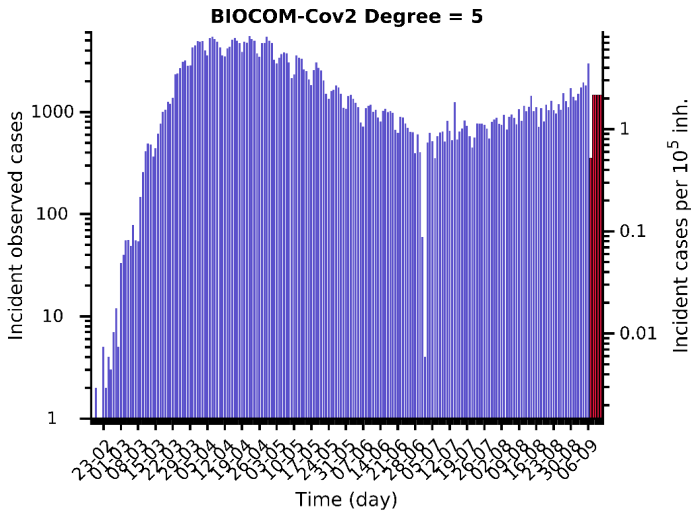
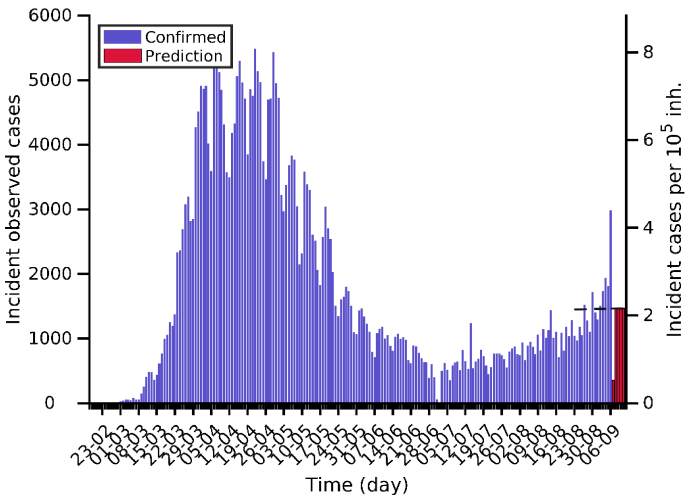
Current indicators		
A_{14}	EPG	CFR
240	254	1.07 %



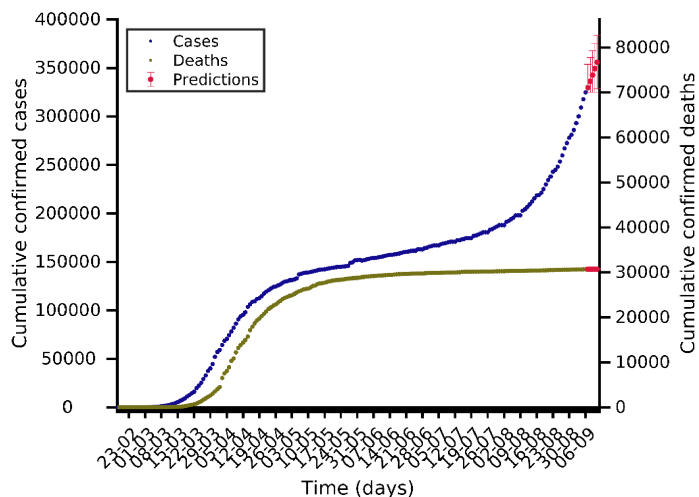


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	347507 (+355)	[347152 - 359945]
09-09-2020	350437 (+1465)	[347152 - 363365]
11-09-2020	353370 (+1467)	[347152 - 367344]

Current indicators		
A ₁₄	EPG	CFR
32	40	0.88 %

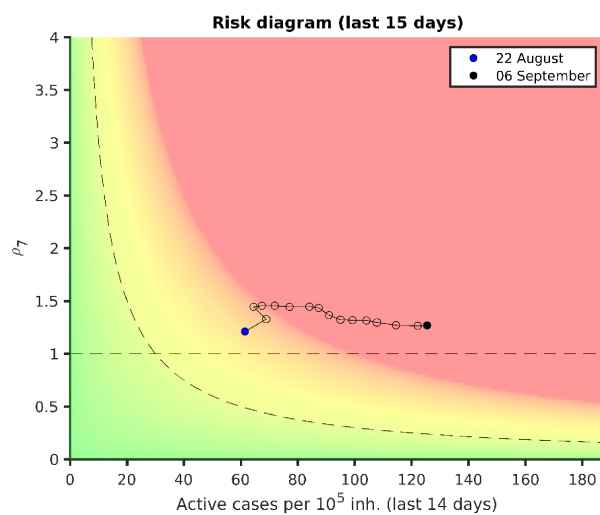
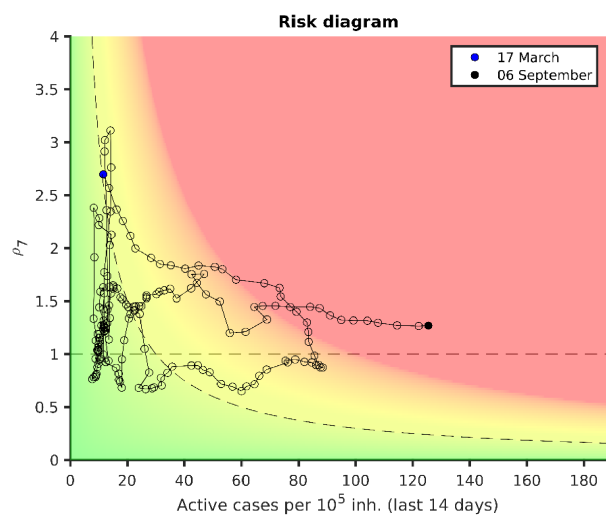
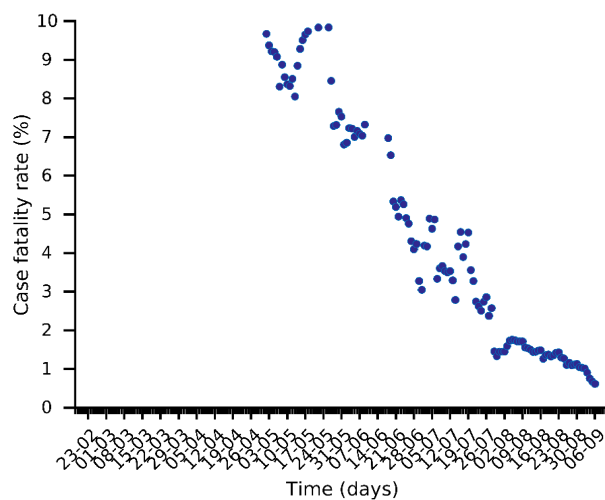
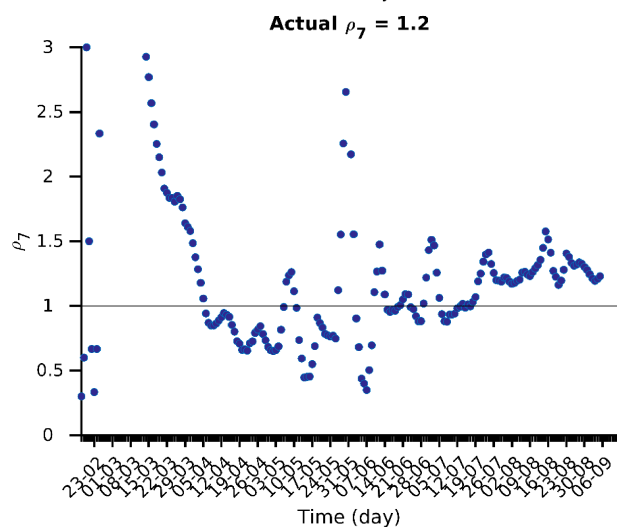
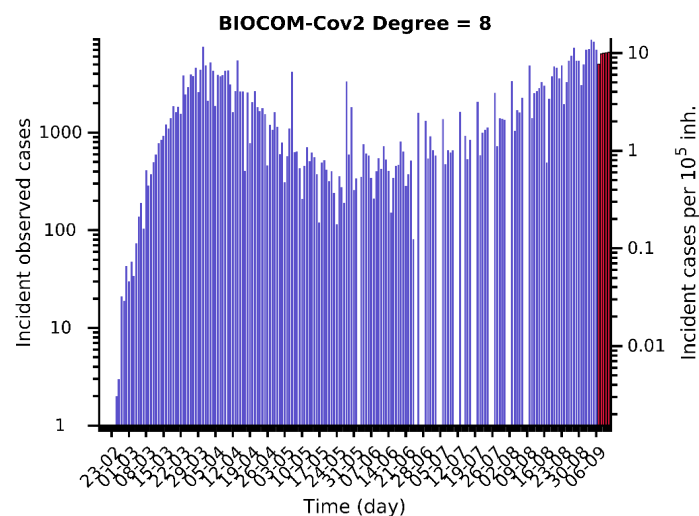
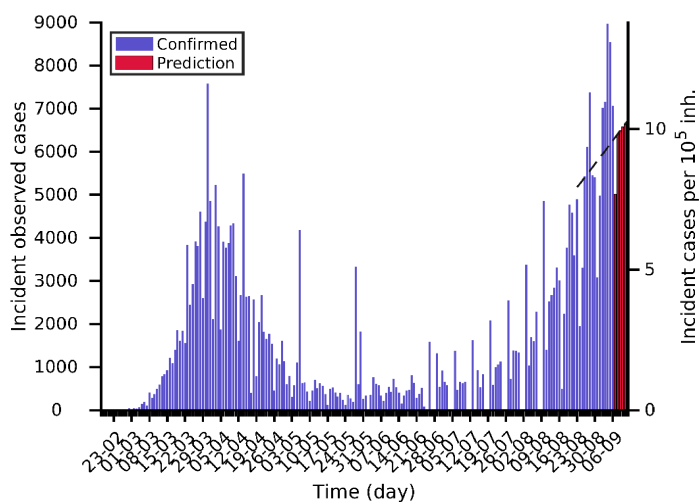


France 06-09-2020. Pop: 65.3M. Cumulative incidence: 498/10⁵

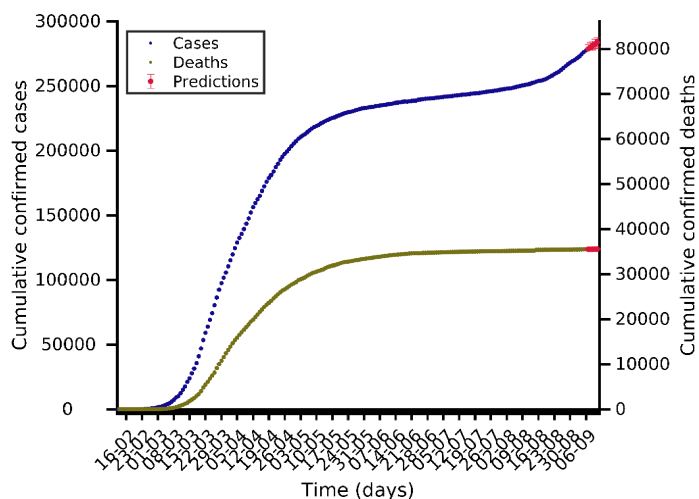


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	329794 (+5017)	[324777 - 353799]
09-09-2020	342706 (+6495)	[324777 - 367803]
11-09-2020	355933 (+6653)	[328362 - 383504]

Current indicators		
A_{14}	EPG	CFR
125	154	0.61 %

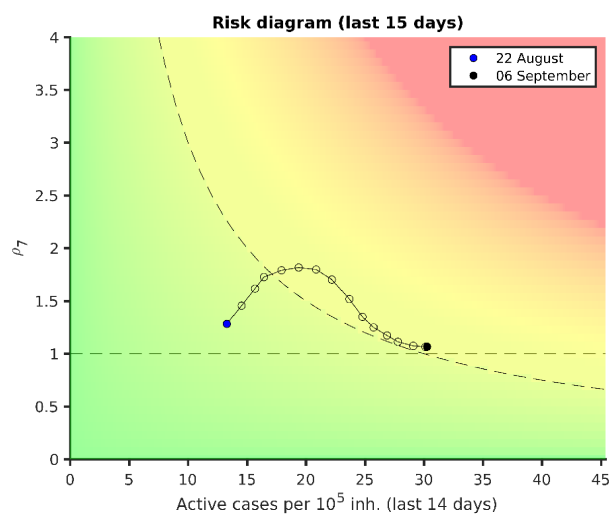
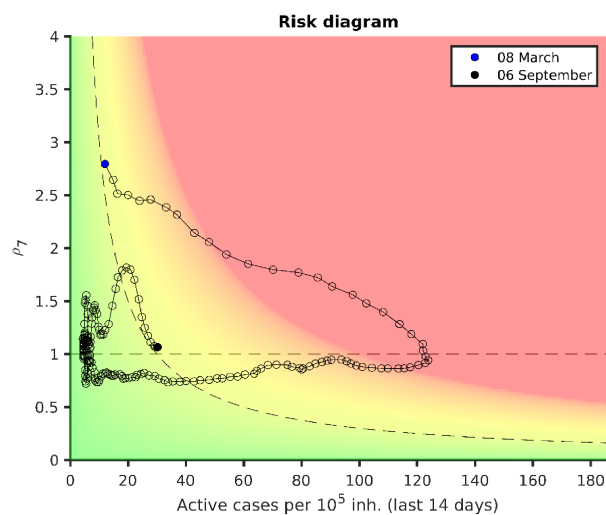
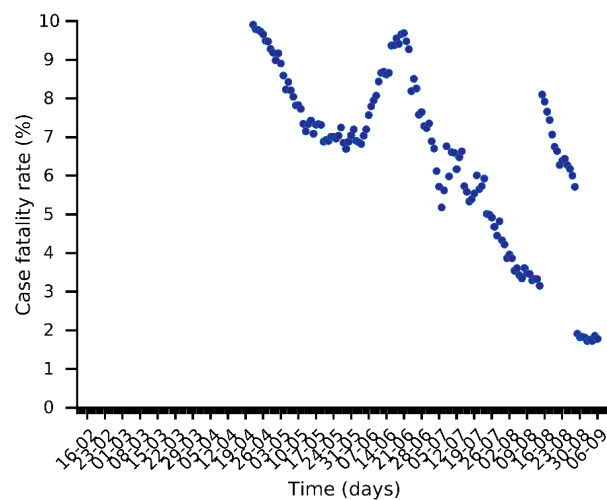
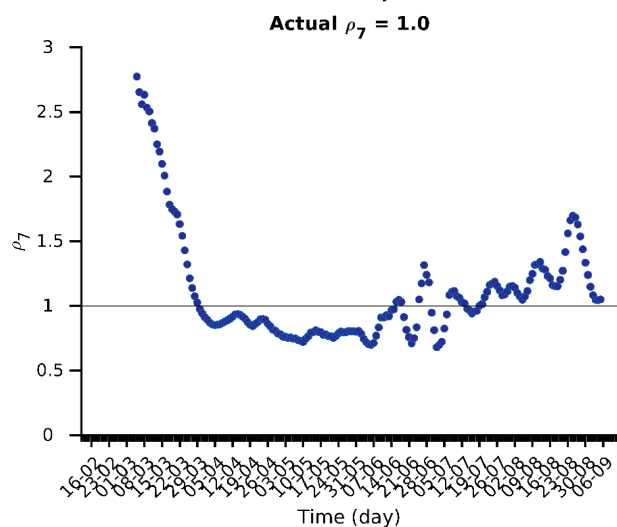
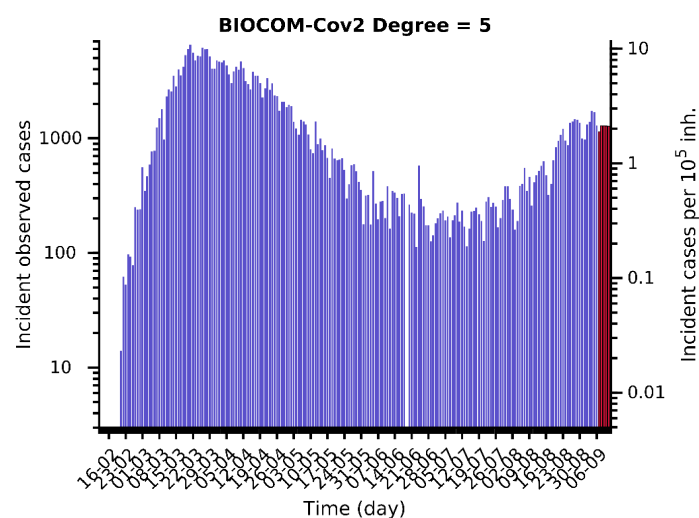
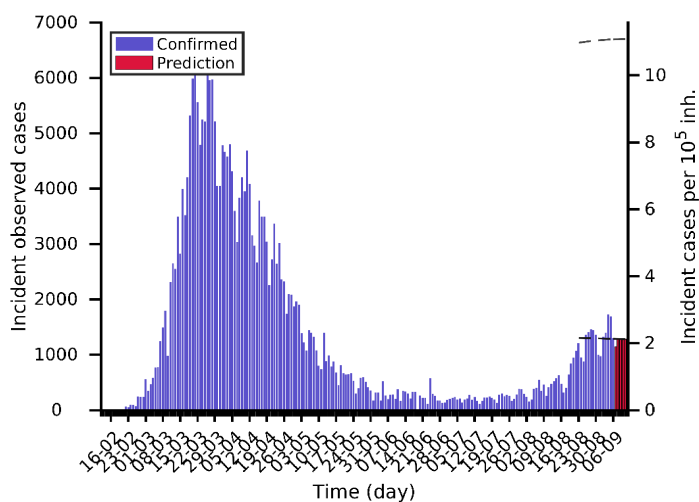


Italy 06-09-2020. Pop: 60.5M. Cumulative incidence: 459/10⁵

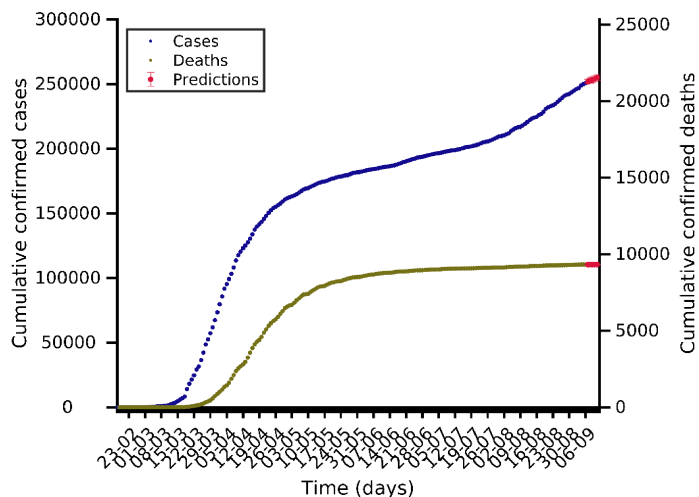


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	278780 (+1146)	[277634 - 282070]
09-09-2020	281351 (+1285)	[277933 - 284769]
11-09-2020	283916 (+1282)	[280225 - 287608]

Current indicators		
A_{14}	EPG	CFR
30	32	1.78 %

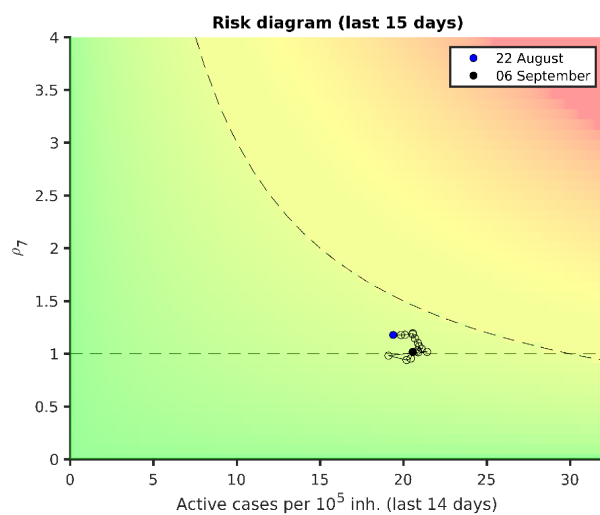
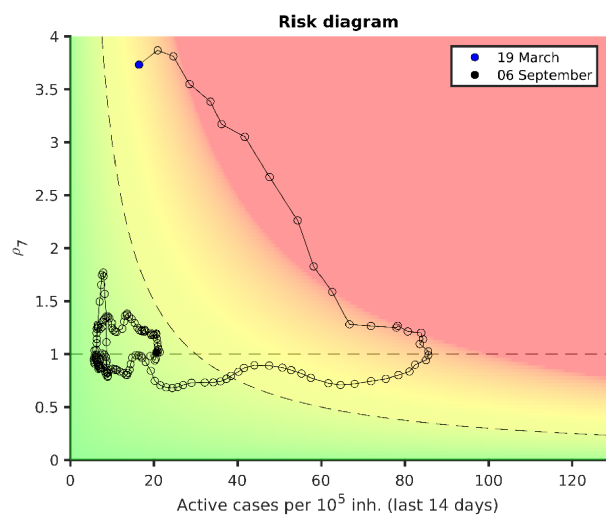
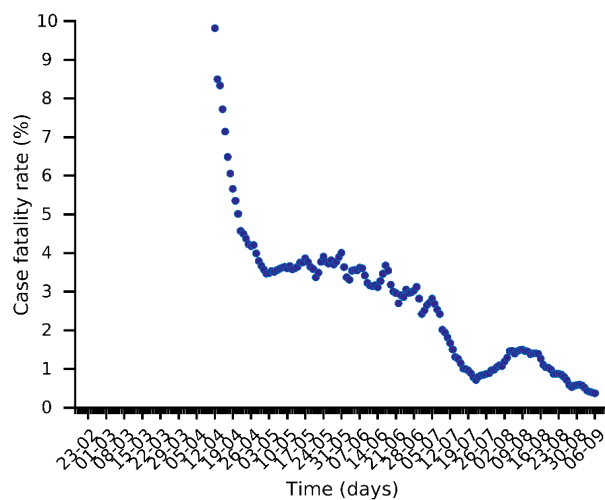
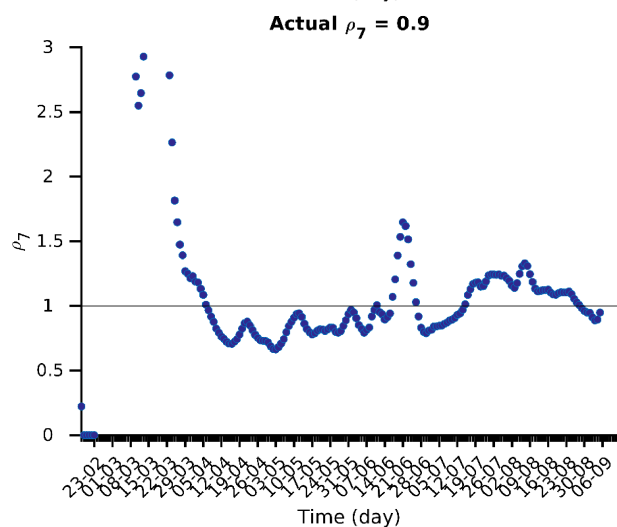
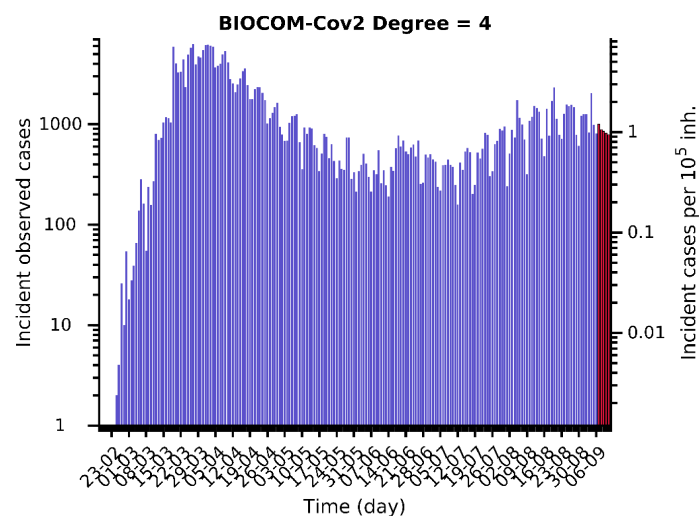
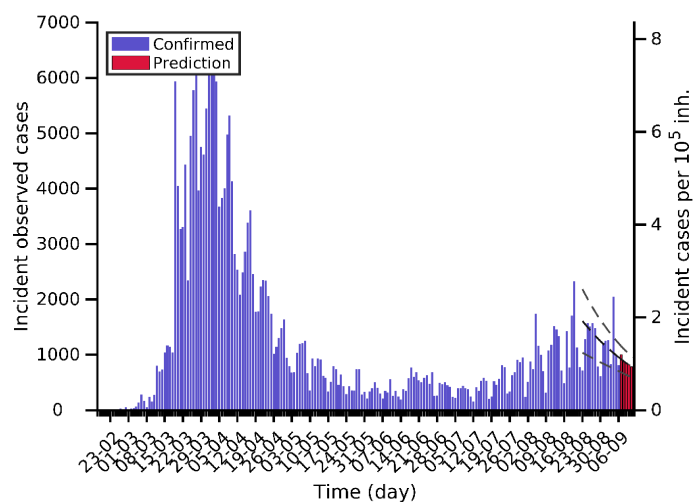


Germany 06-09-2020. Pop: 83.8M. Cumulative incidence: 299/10⁵

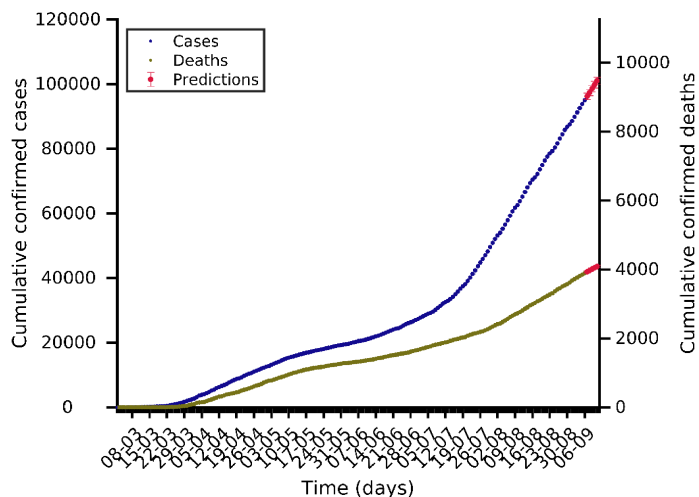


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	251800 (+1001)	[250799 - 253821]
09-09-2020	253533 (+850)	[251453 - 255614]
11-09-2020	255136 (+786)	[252946 - 257327]

Current indicators		
A_{14}	EPG	CFR
21	20	0.37 %

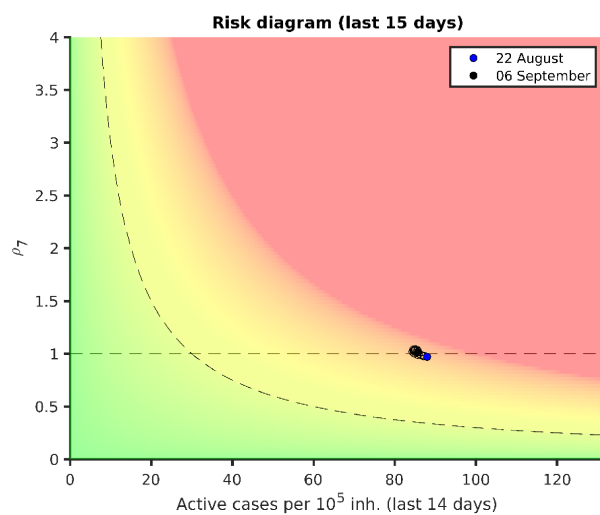
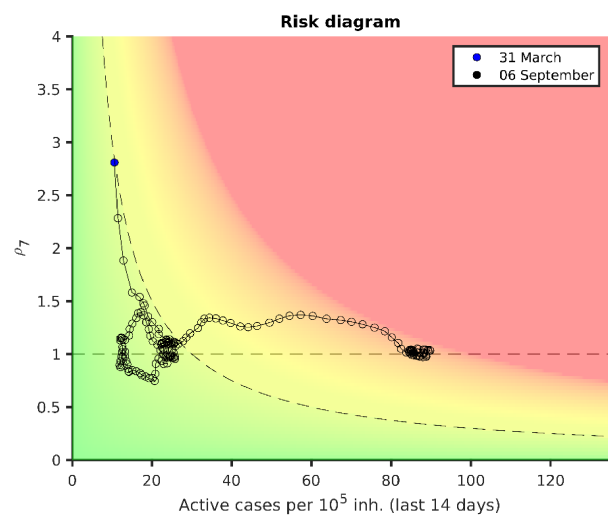
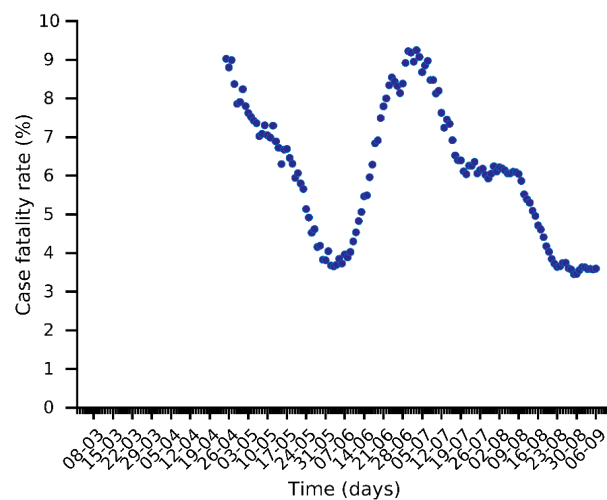
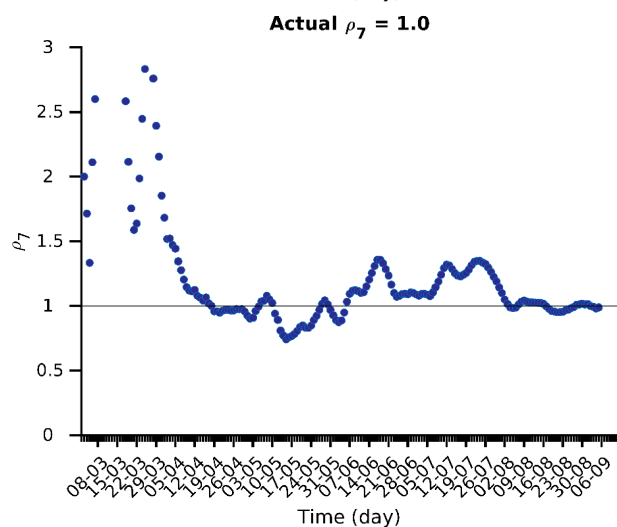
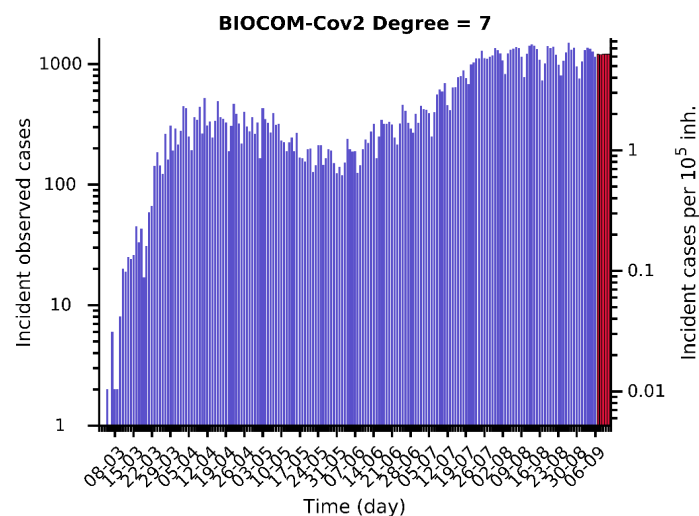
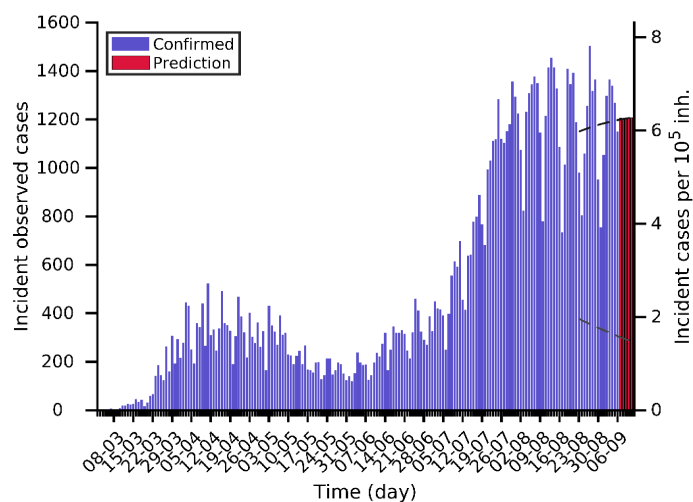


Romania 06-09-2020. Pop: 19.2M. Cumulative incidence: 494/10⁵

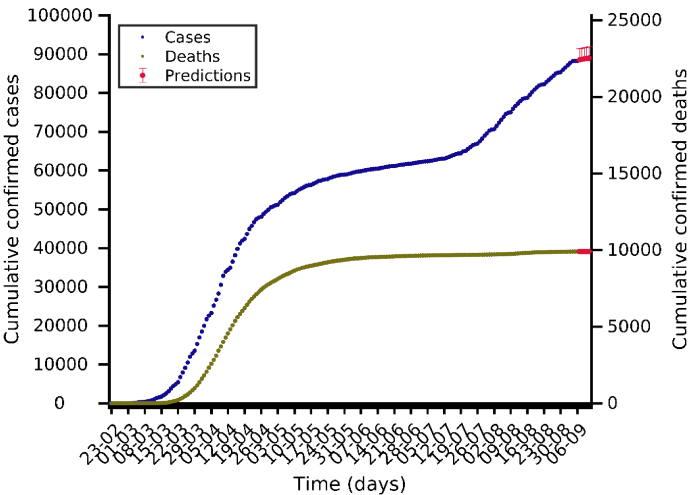


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	96219 (+1205)	[95241 - 97196]
09-09-2020	98624 (+1204)	[97606 - 99642]
11-09-2020	101037 (+1207)	[99932 - 102141]

Current indicators		
A_{14}	EPG	CFR
86	85	3.59 %

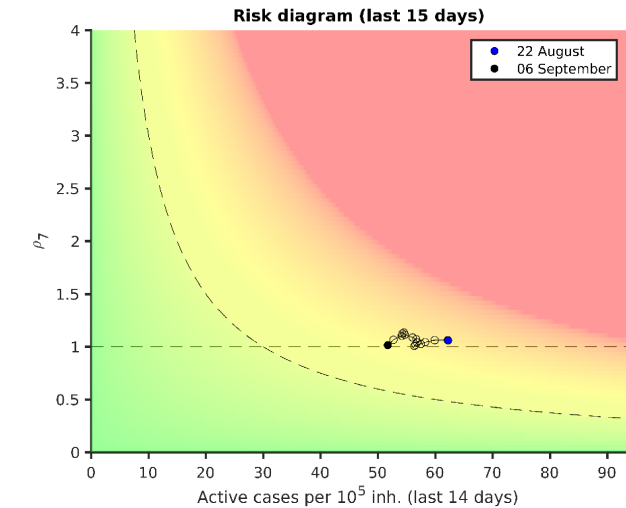
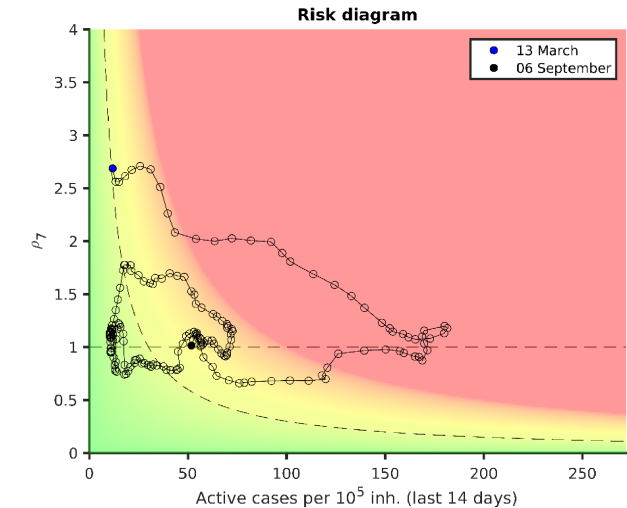
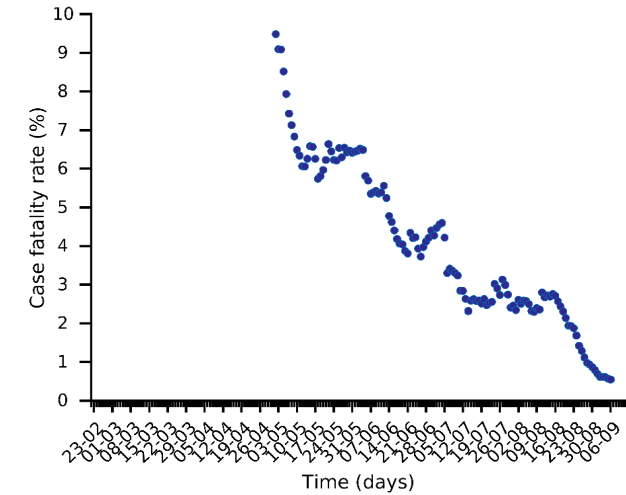
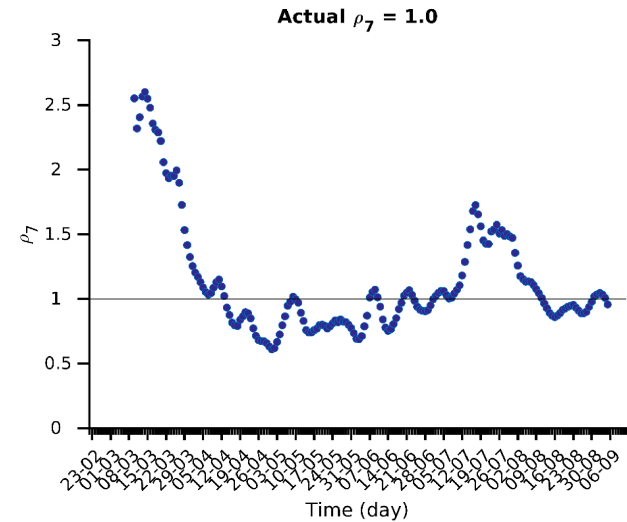
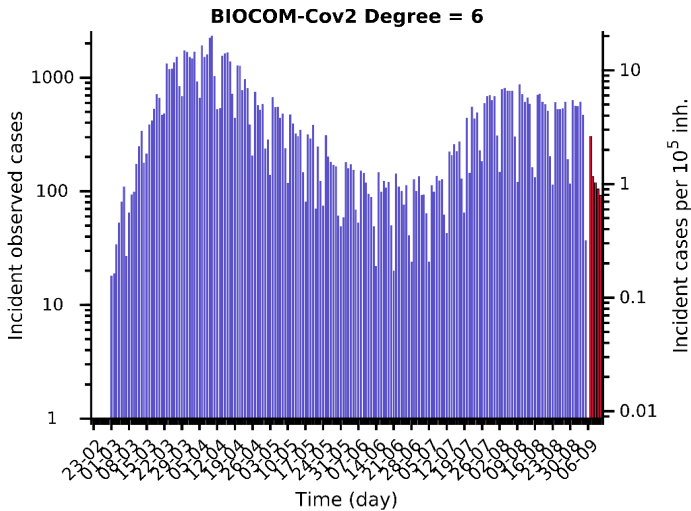
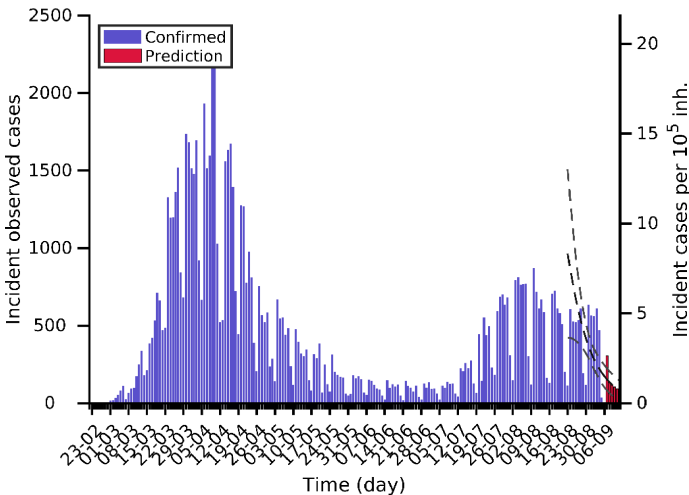


Belgium 06-09-2020. Pop: 11.6M. Cumulative incidence: 762/10⁵

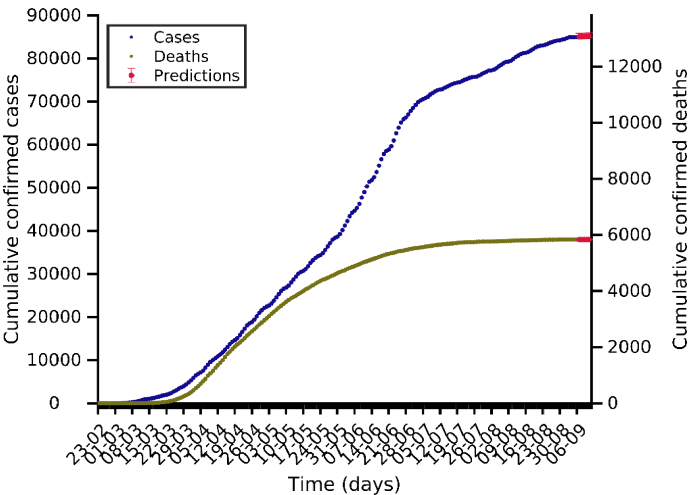


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	88578 (+305)	[88273 - 91379]
09-09-2020	88832 (+119)	[88273 - 91670]
11-09-2020	89029 (+92)	[88273 - 91921]

Current indicators		
A ₁₄	EPG	CFR
52	50	0.54 %

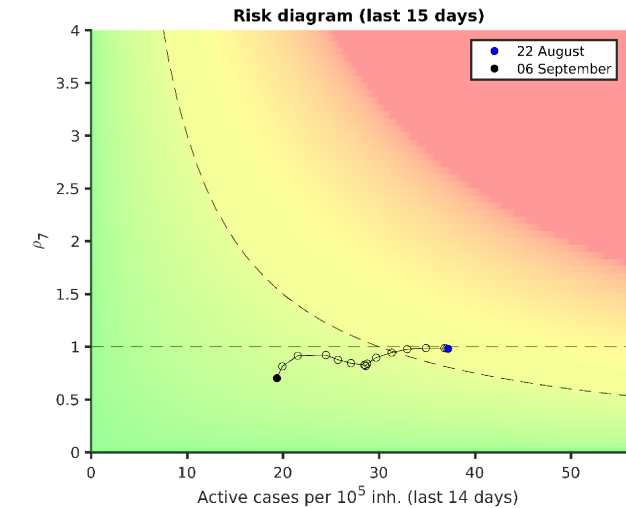
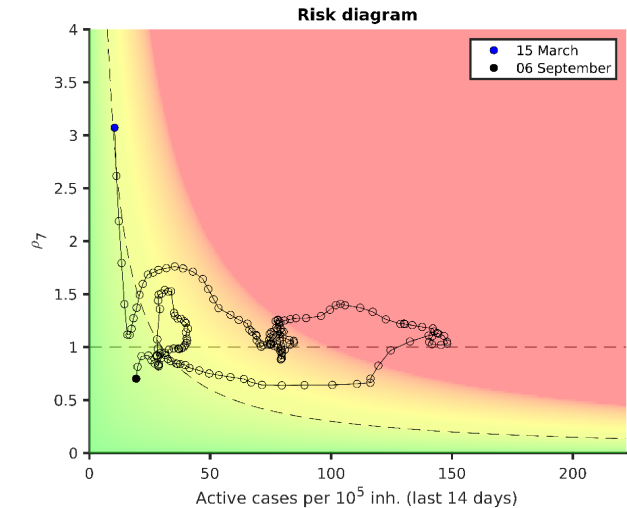
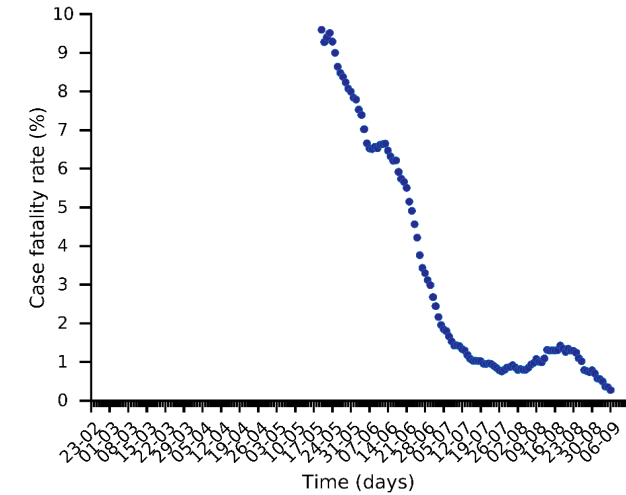
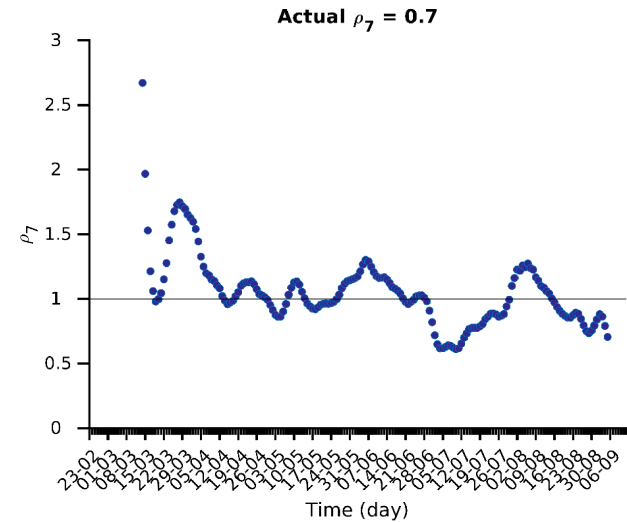
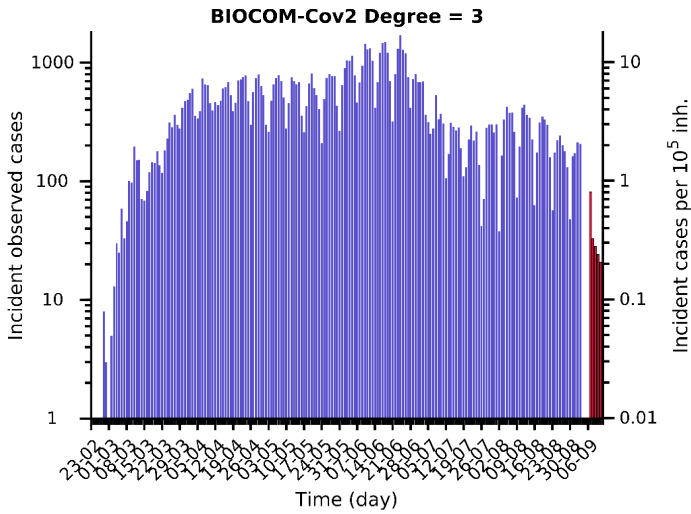
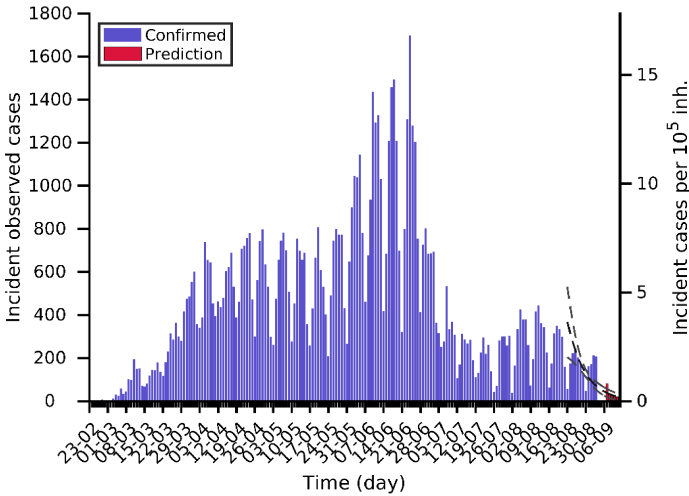


Sweden 06-09-2020. Pop: 10.1M. Cumulative incidence: 841/10⁵

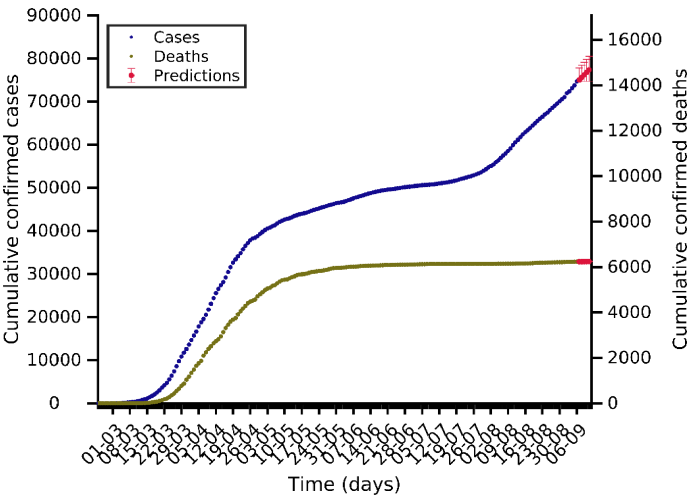


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	85066 (+81)	[84985 - 85837]
09-09-2020	85127 (+28)	[84985 - 85906]
11-09-2020	85173 (+21)	[84985 - 85961]

Current indicators		
A ₁₄	EPG	CFR
19	14	0.27 %

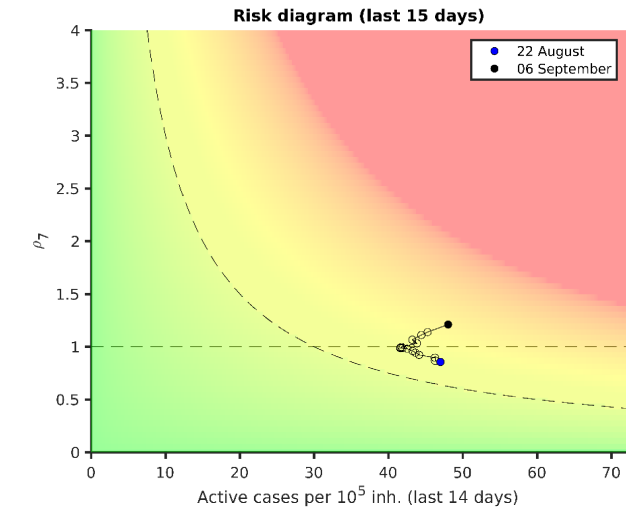
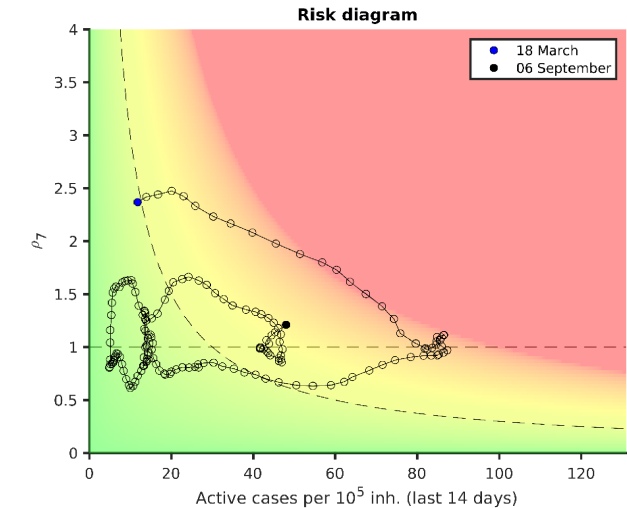
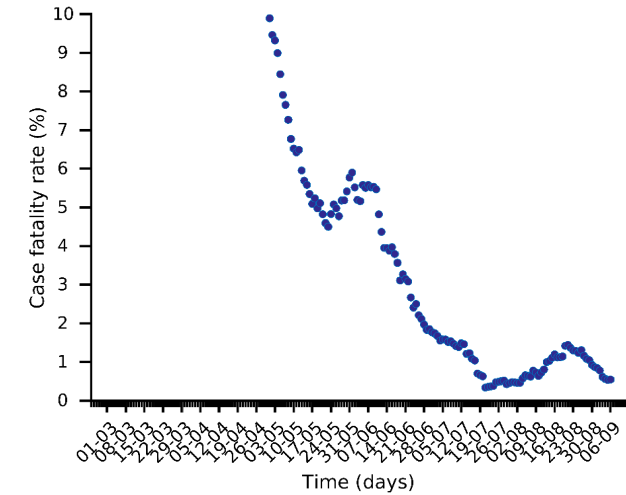
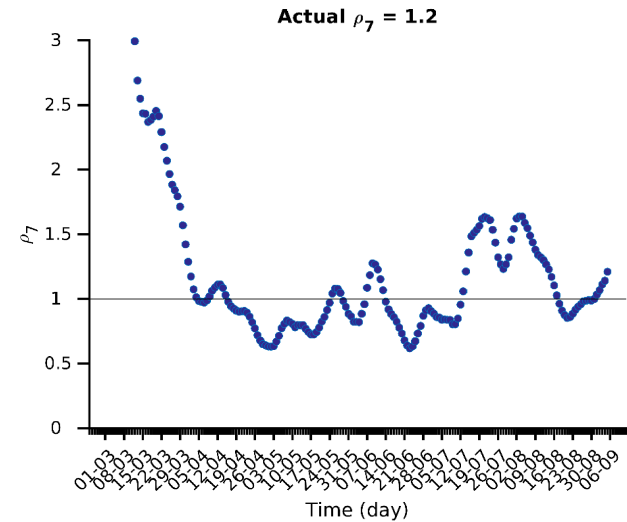
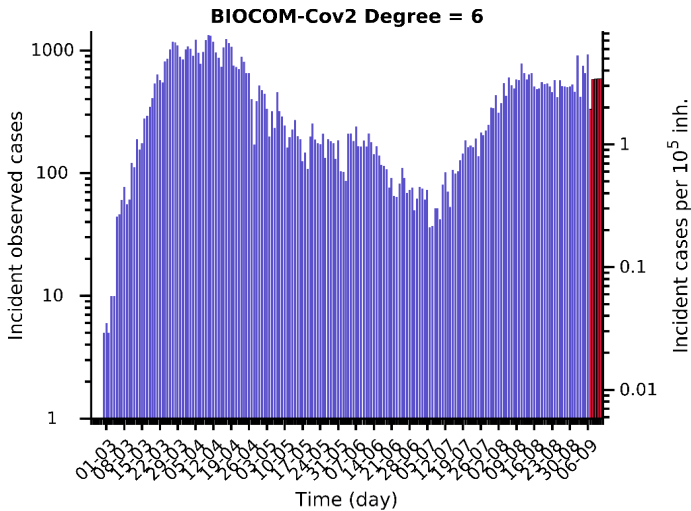
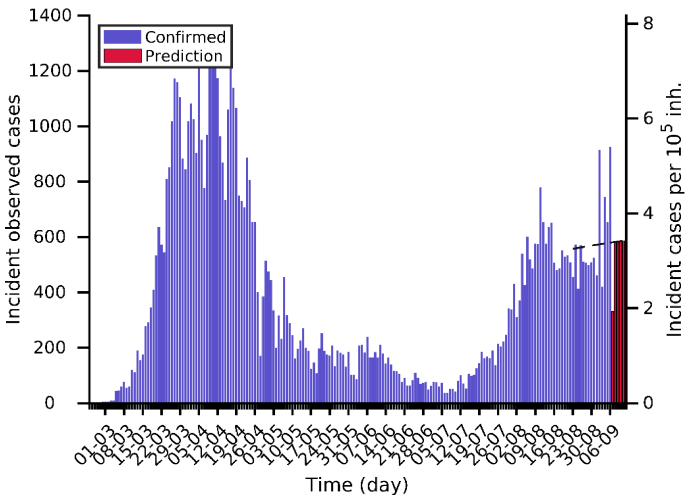


Netherlands 06-09-2020. Pop: 17.1M. Cumulative incidence: 436/10⁵

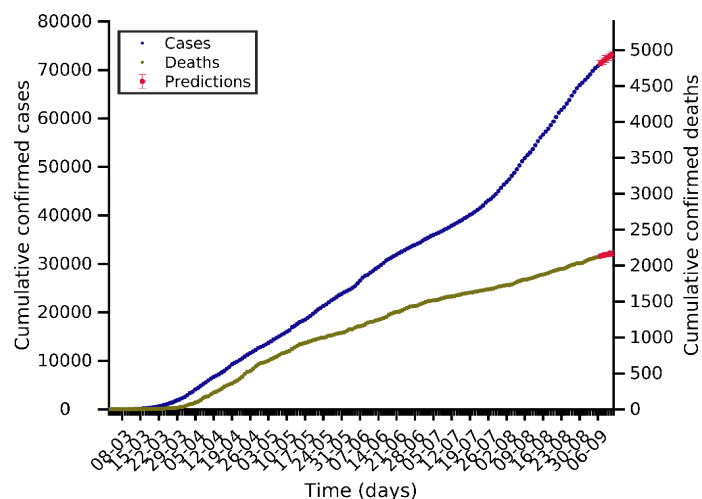


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	75046 (+331)	[74715 - 77855]
09-09-2020	76212 (+584)	[74715 - 79134]
11-09-2020	77384 (+587)	[74715 - 80552]

Current indicators		
A ₁₄	EPG	CFR
48	58	0.54 %



Poland 06-09-2020. Pop: 37.8M. Cumulative incidence: 187/10⁵

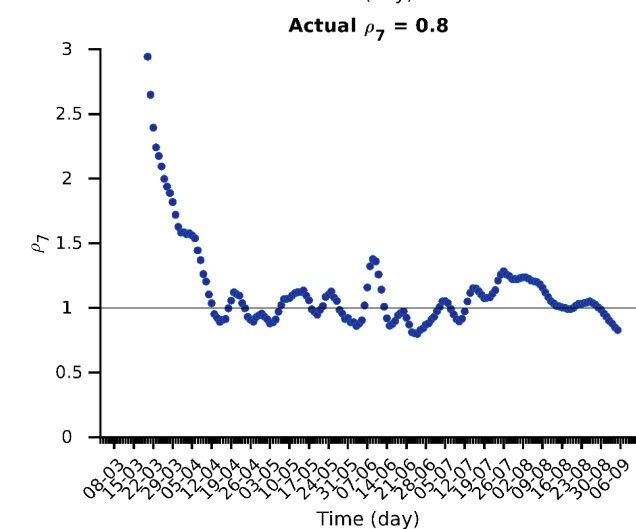
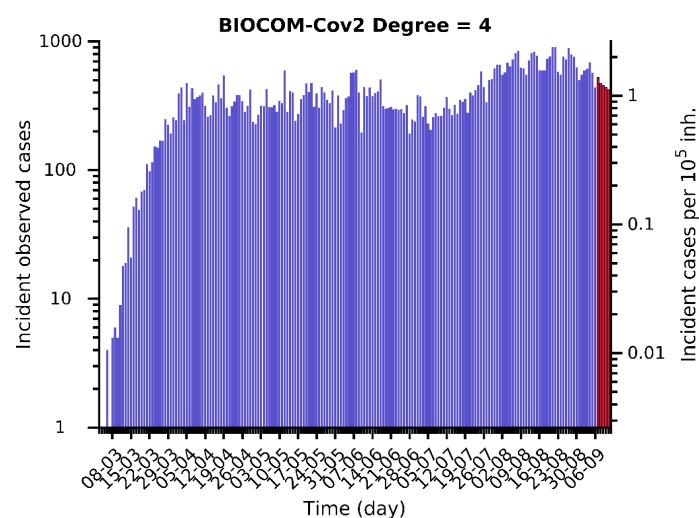
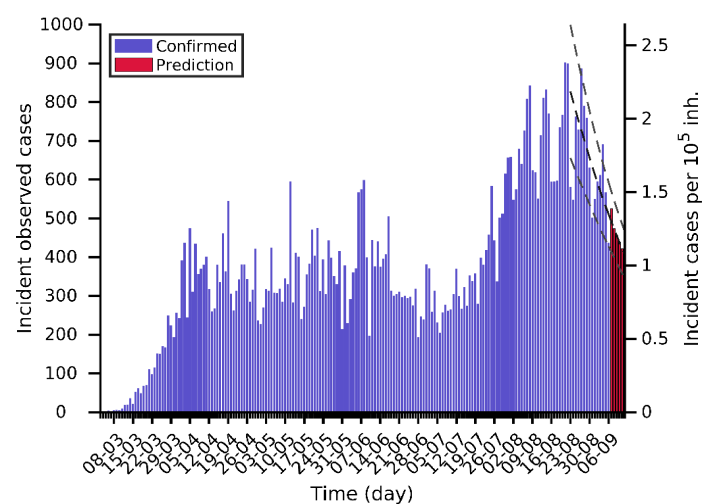


Predictions for next days

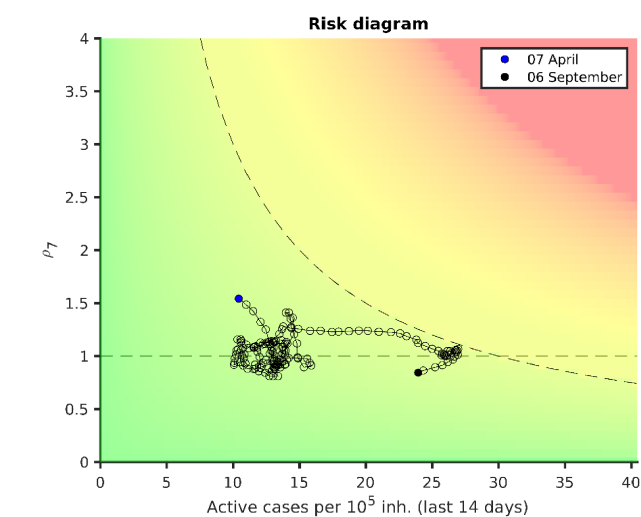
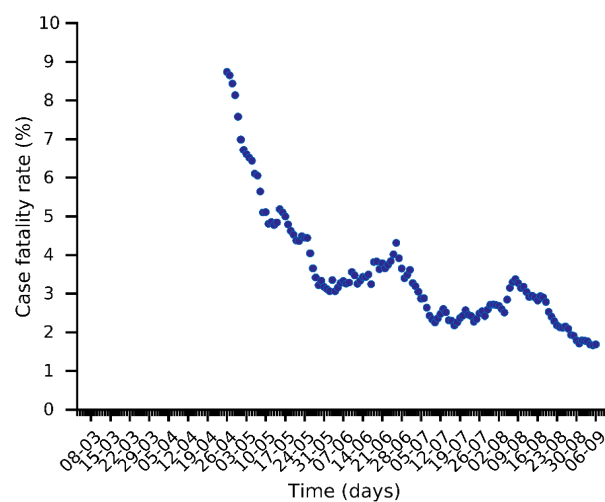
Day	Number of cases	95% Confidence Interval
07-09-2020	71349 (+525)	[70824 - 72010]
09-09-2020	72278 (+456)	[71597 - 72959]
11-09-2020	73139 (+422)	[72420 - 73857]

Current indicators

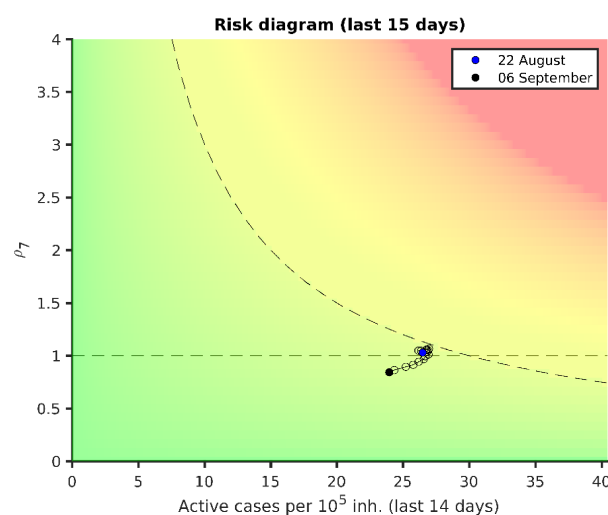
A_{14}	EPG	CFR
24	20	1.69 %



Actual $\rho_7 = 0.8$

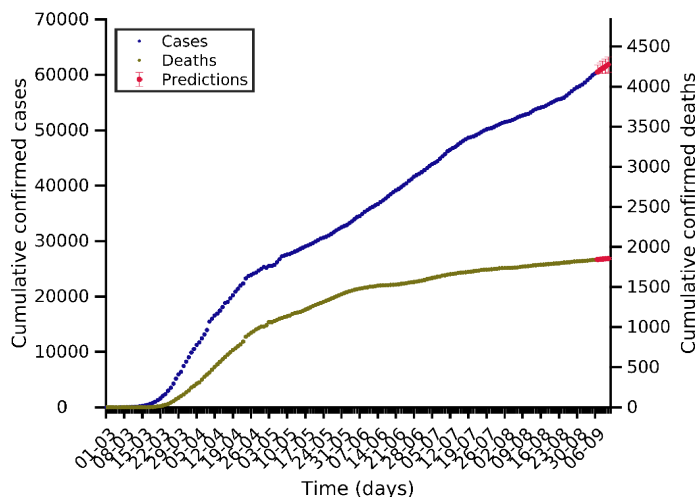


Risk diagram



Risk diagram (last 15 days)

Portugal 06-09-2020. Pop: 10.2M. Cumulative incidence: 591/10⁵

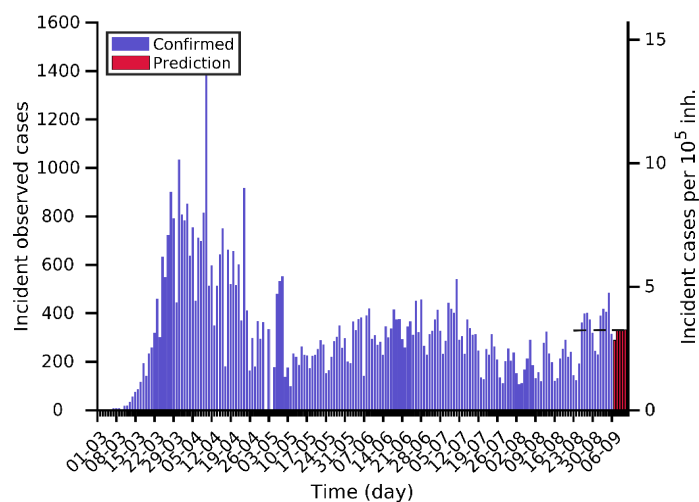


Predictions for next days

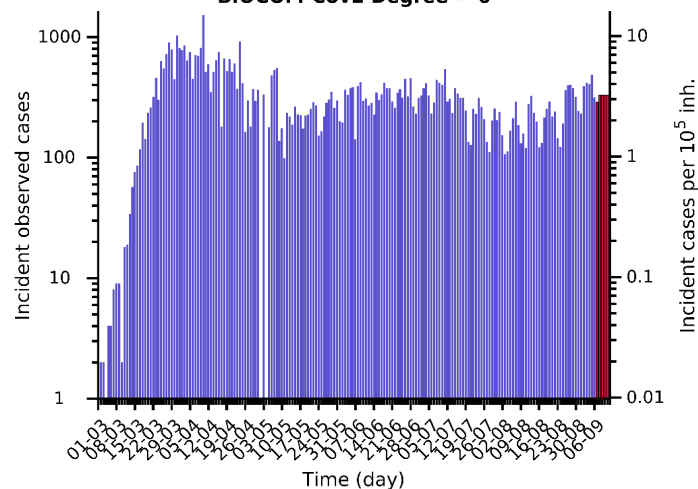
Day	Number of cases	95% Confidence Interval
07-09-2020	60547 (+289)	[60258 - 61770]
09-09-2020	61208 (+331)	[60258 - 62479]
11-09-2020	61870 (+331)	[60495 - 63244]

Current indicators

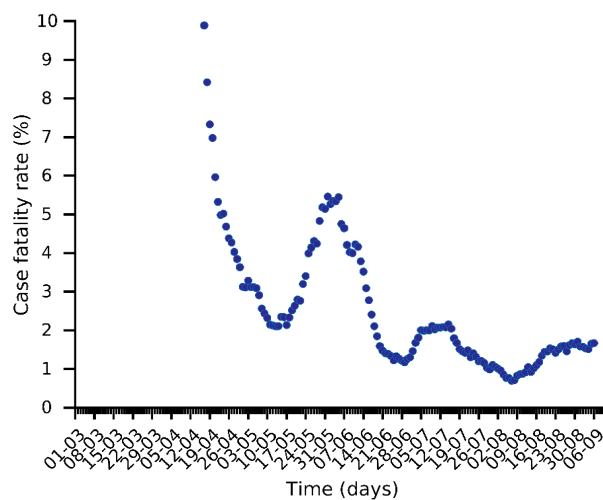
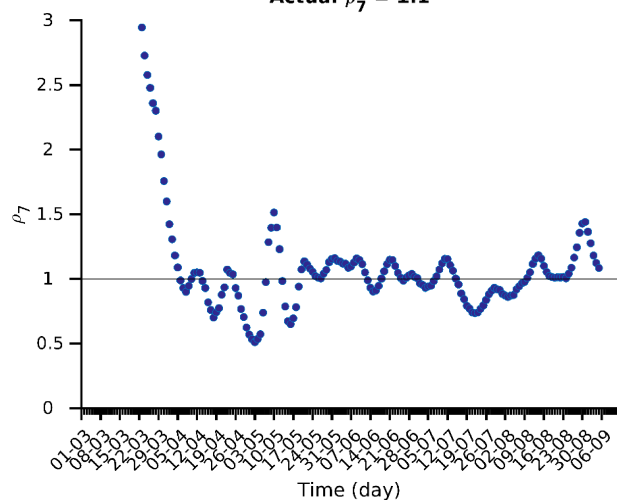
A_{14}	EPG	CFR
46	50	1.67 %



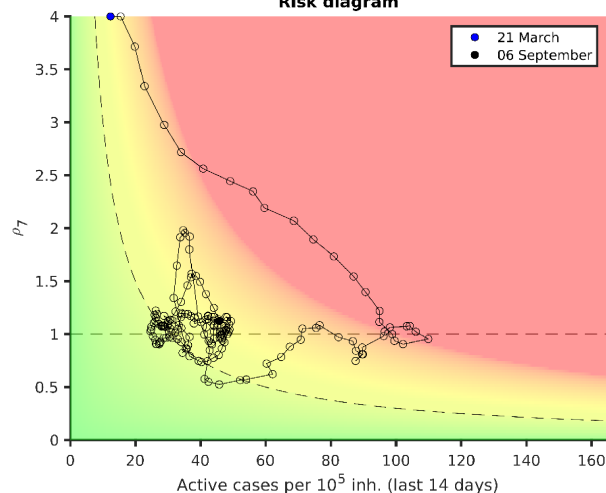
BIOCOM-Cov2 Degree = 6



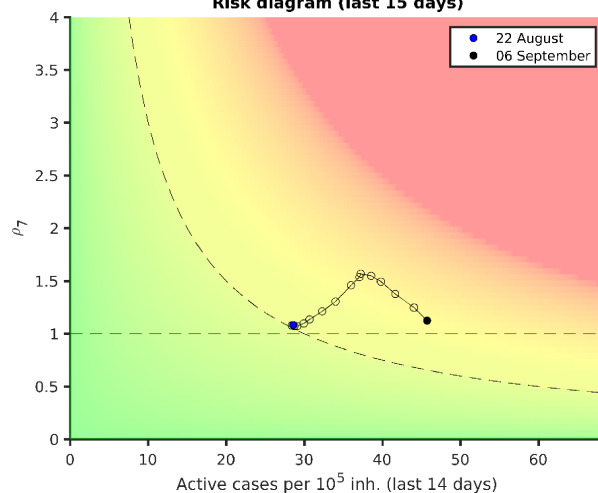
Actual $\rho_7 = 1.1$



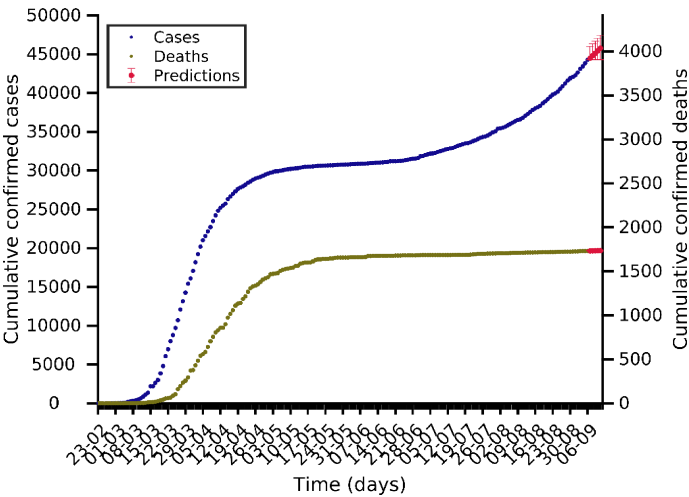
Risk diagram



Risk diagram (last 15 days)

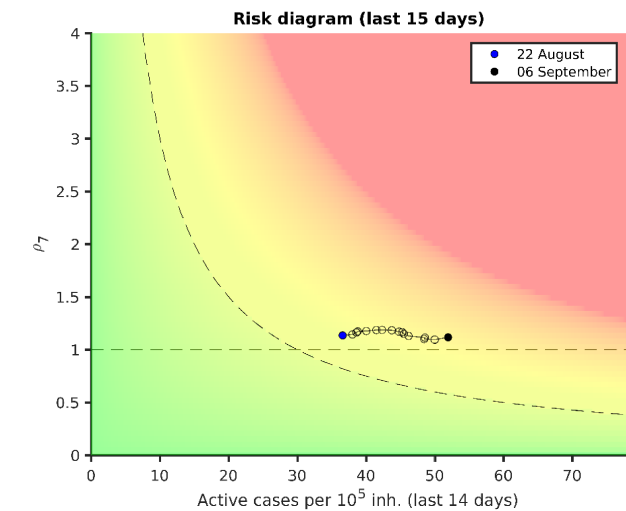
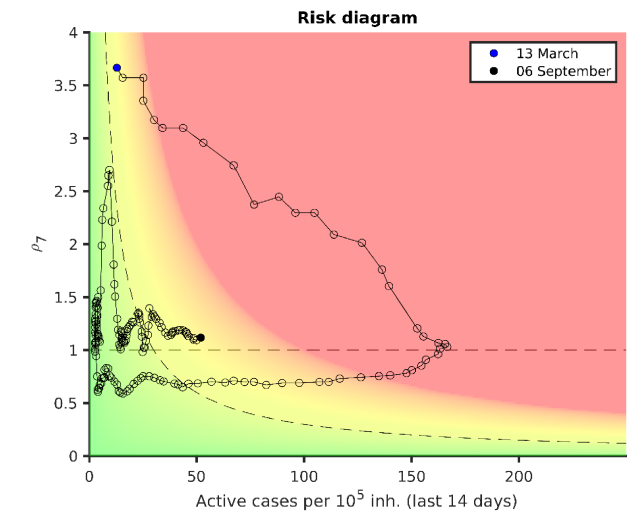
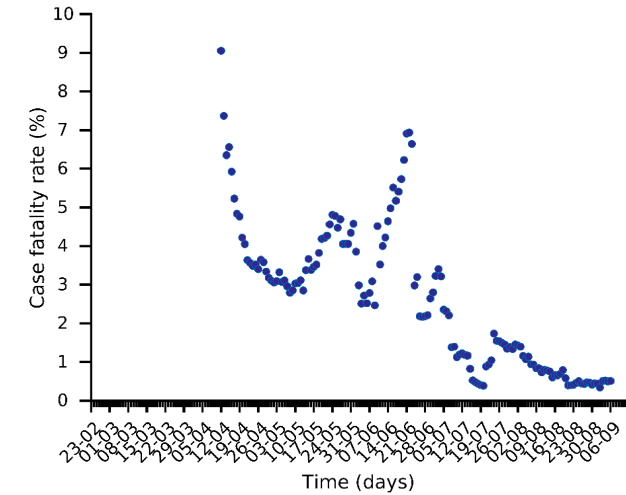
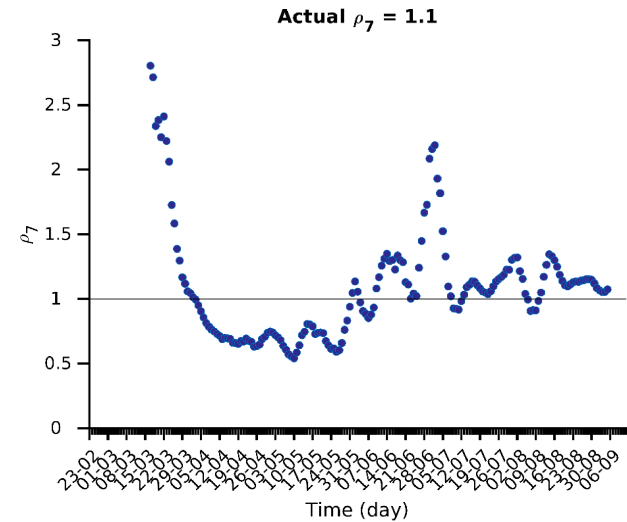
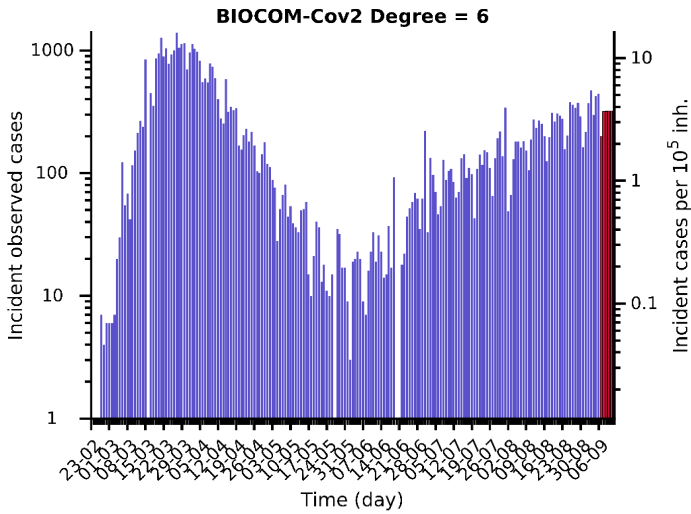
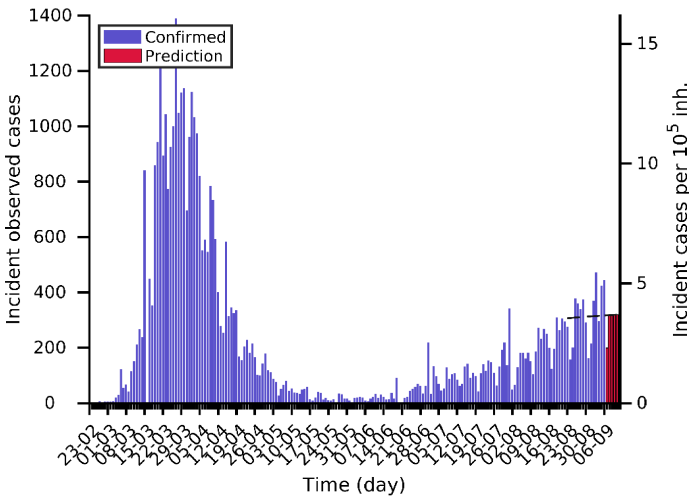


Switzerland 06-09-2020. Pop: 8.7M. Cumulative incidence: 512/10⁵

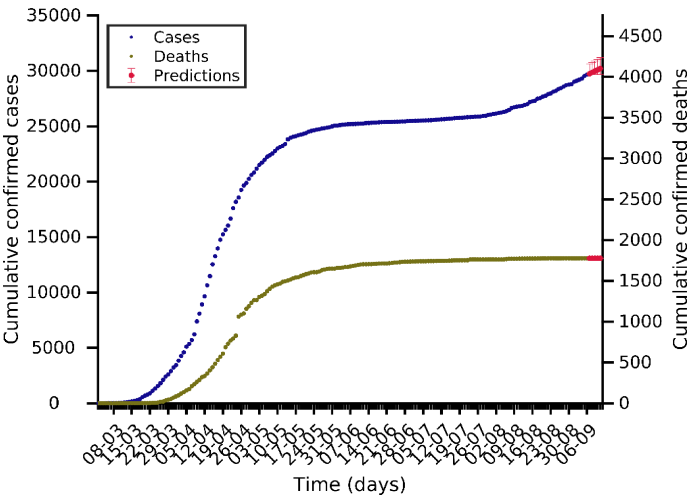


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	44493 (+200)	[44293 - 45998]
09-09-2020	45130 (+319)	[44293 - 46695]
11-09-2020	45769 (+320)	[44293 - 47465]

Current indicators		
A ₁₄	EPG	CFR
52	56	0.51 %

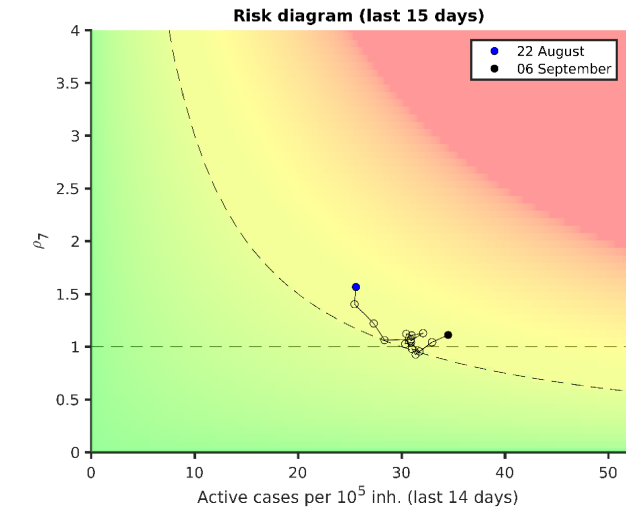
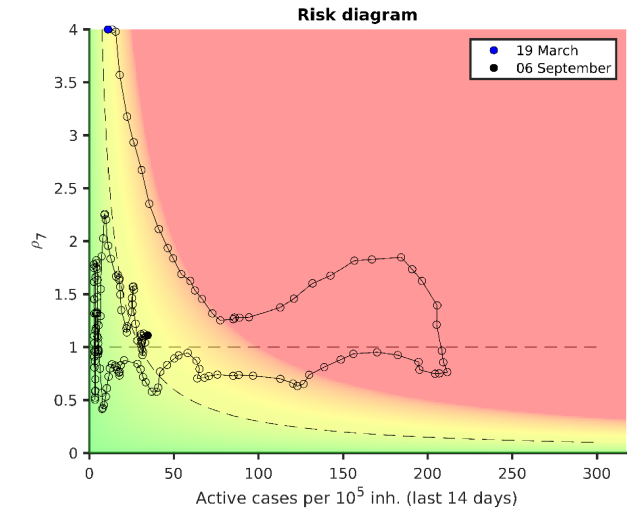
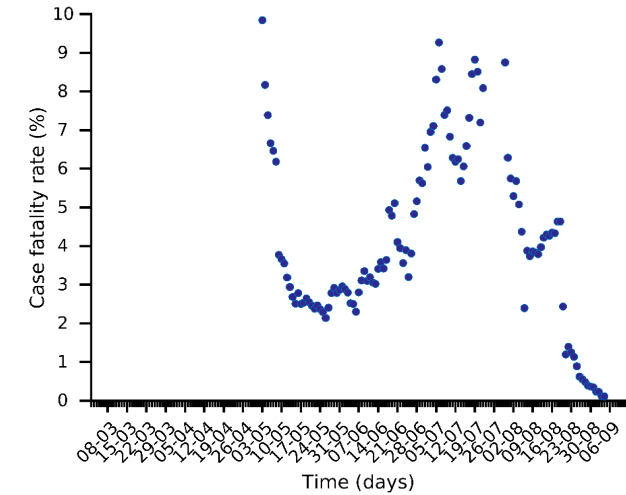
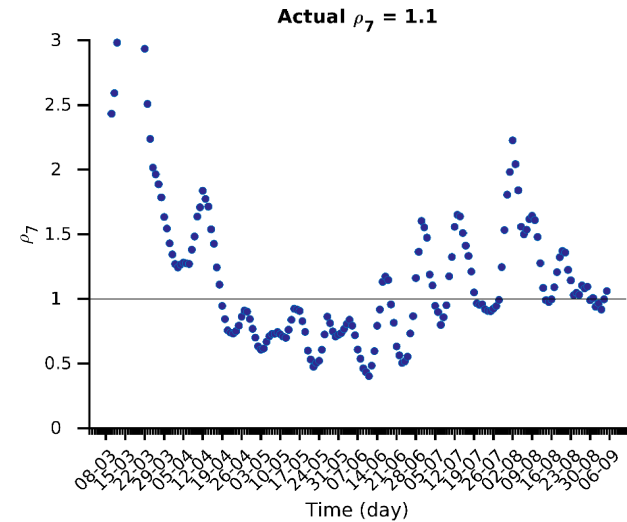
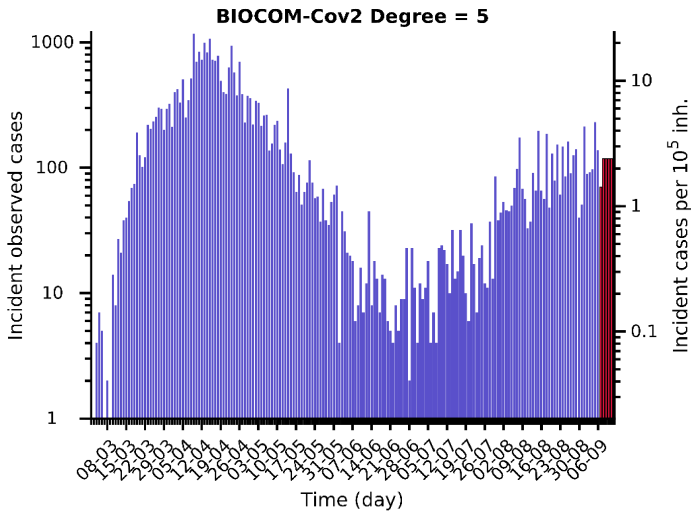
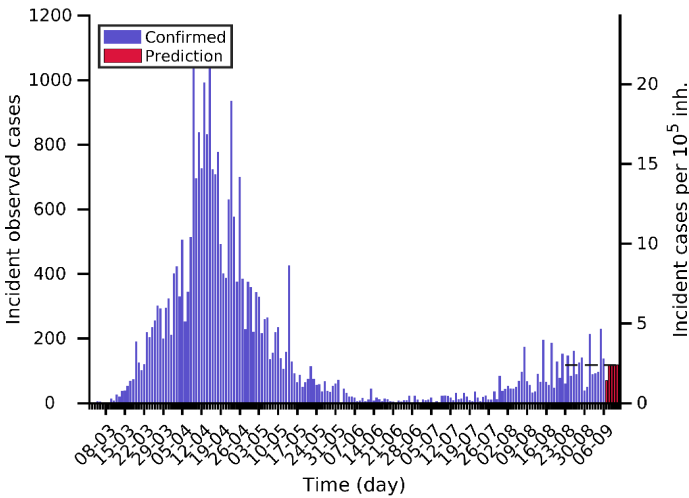


Ireland 06-09-2020. Pop: 4.9M. Cumulative incidence: 601/10⁵

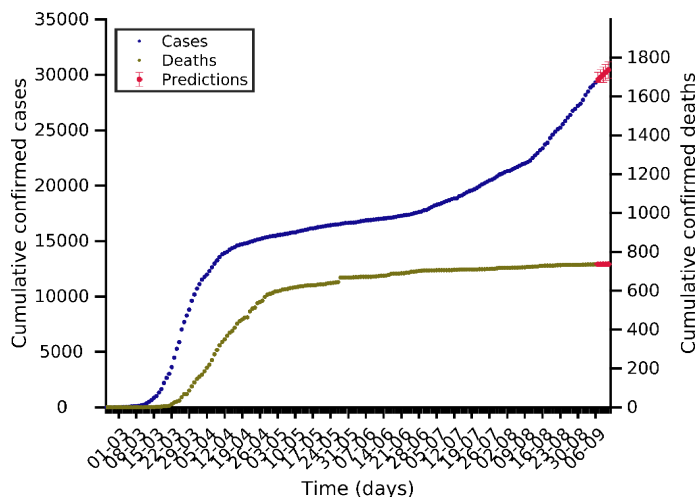


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	29742 (+70)	[29672 - 30607]
09-09-2020	29979 (+118)	[29672 - 30877]
11-09-2020	30215 (+118)	[29672 - 31186]

Current indicators		
A ₁₄	EPG	CFR
34	37	0.00 %



Austria 06-09-2020. Pop: 9.0M. Cumulative incidence: 325/10⁵

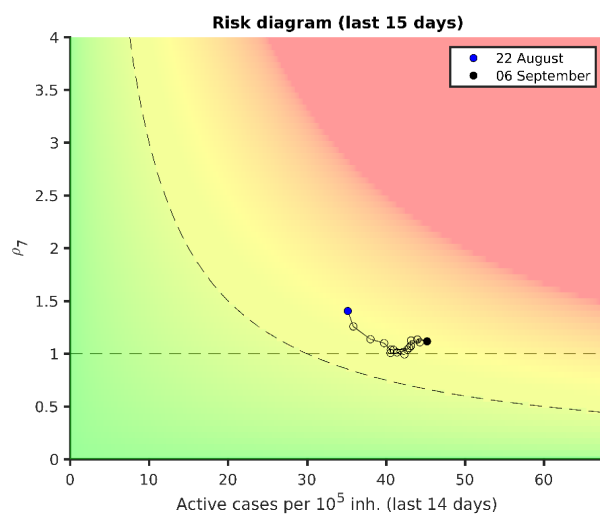
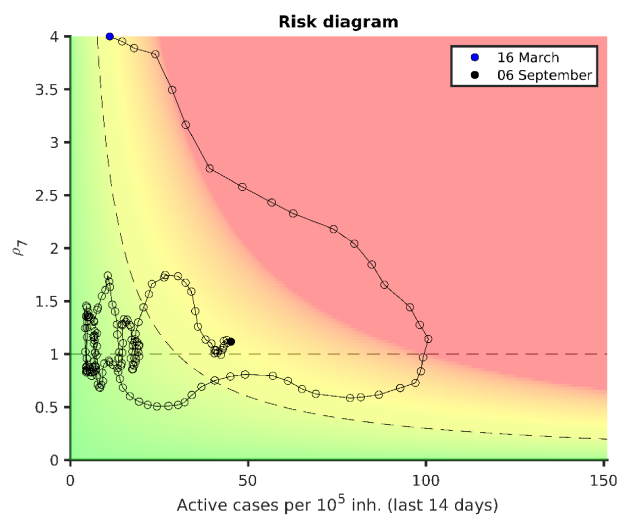
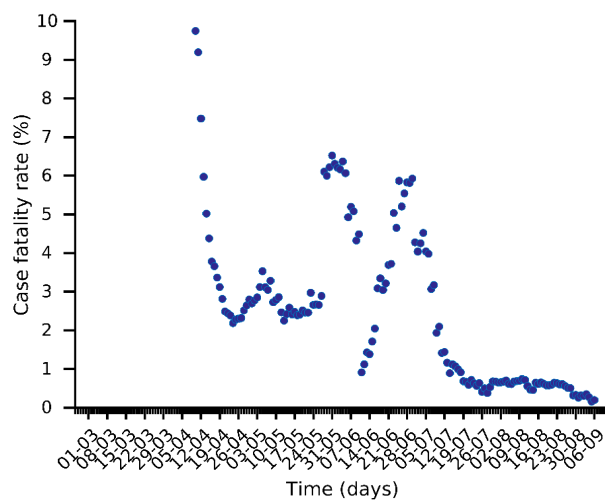
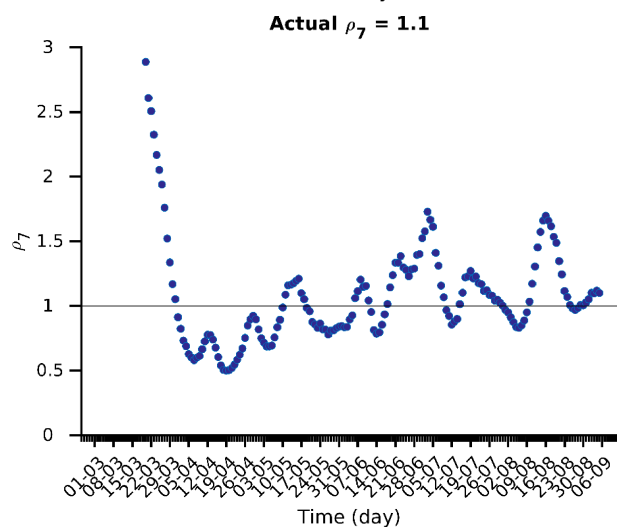
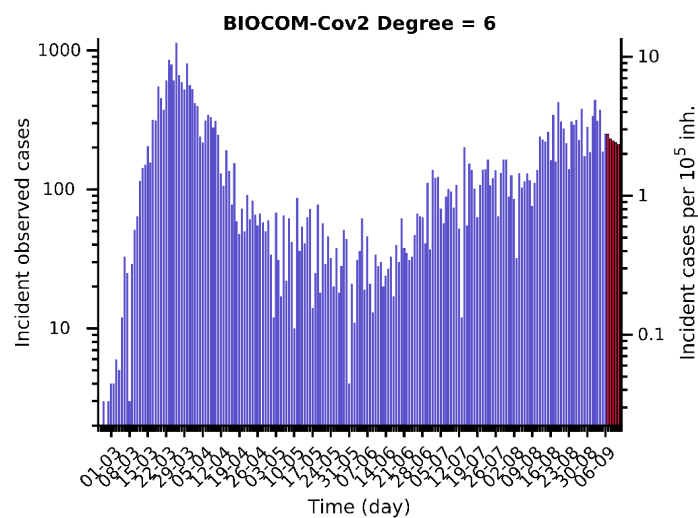
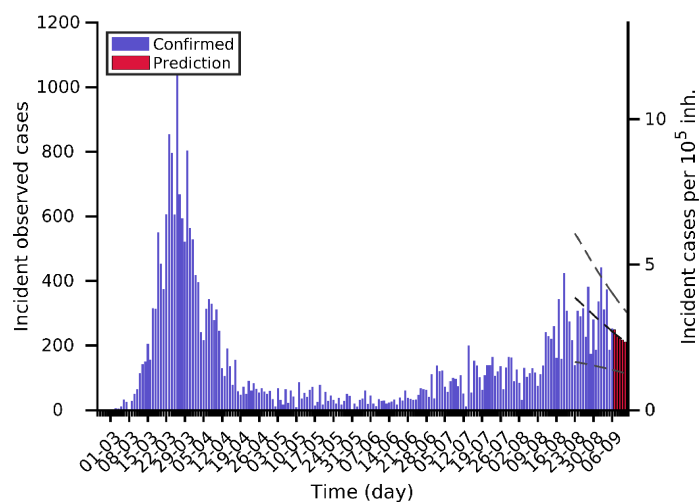


Predictions for next days

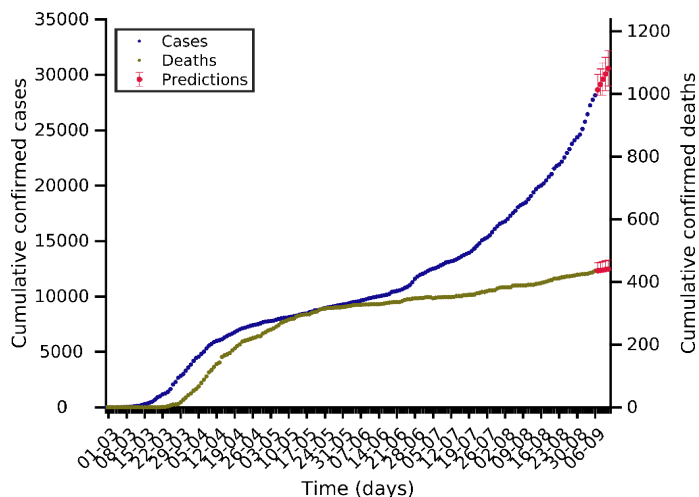
Day	Number of cases	95% Confidence Interval
07-09-2020	29557 (+249)	[29308 - 30231]
09-09-2020	30012 (+224)	[29315 - 30708]
11-09-2020	30441 (+211)	[29702 - 31179]

Current indicators

A_{14}	EPG	CFR
45	50	0.19 %

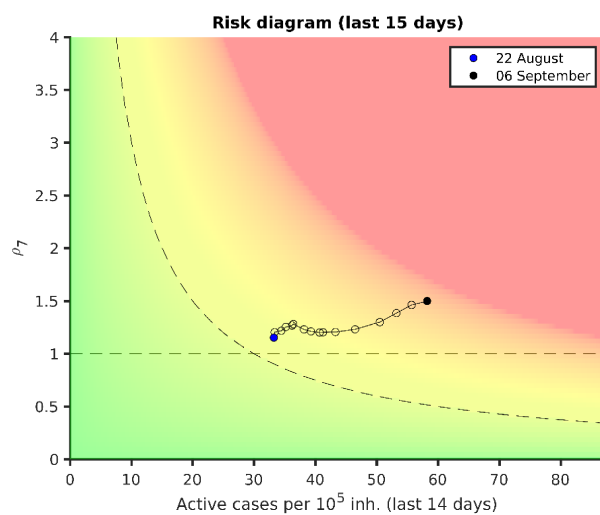
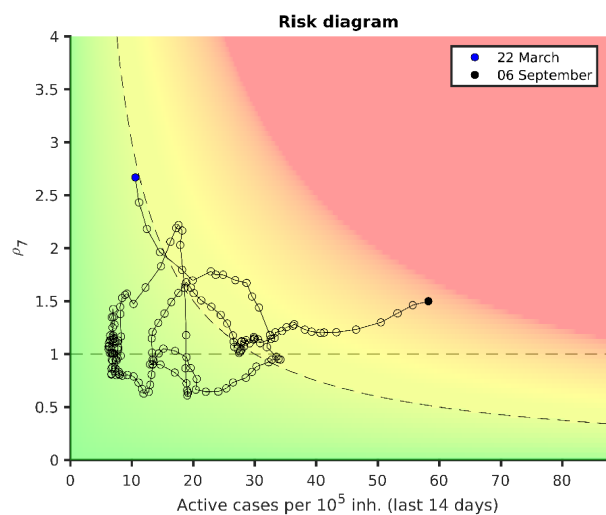
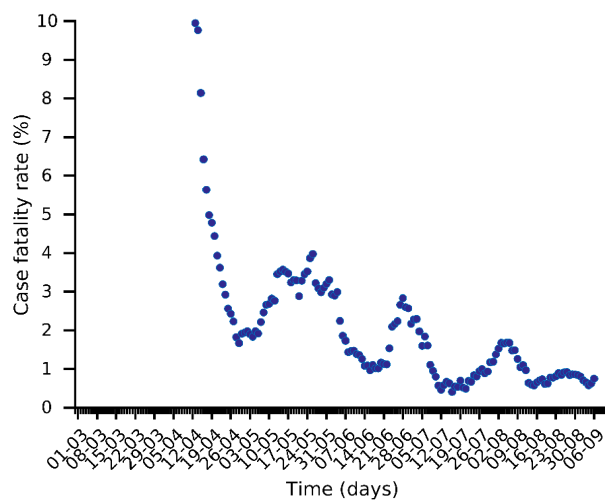
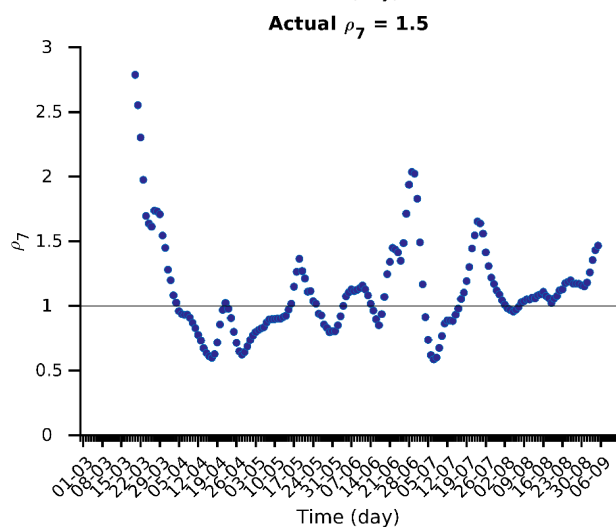
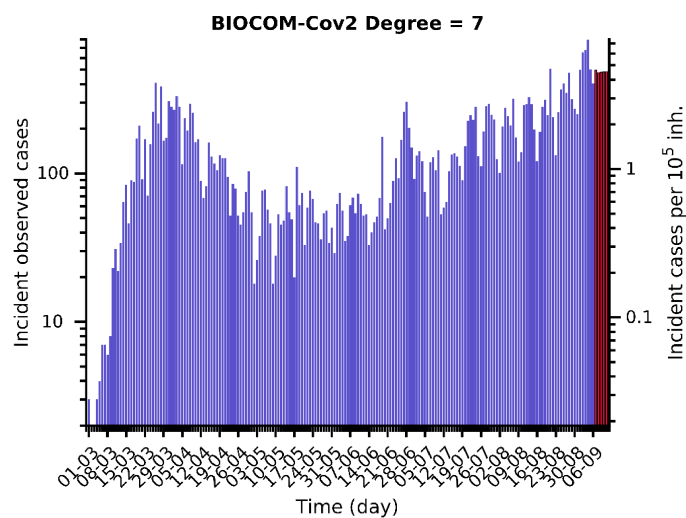
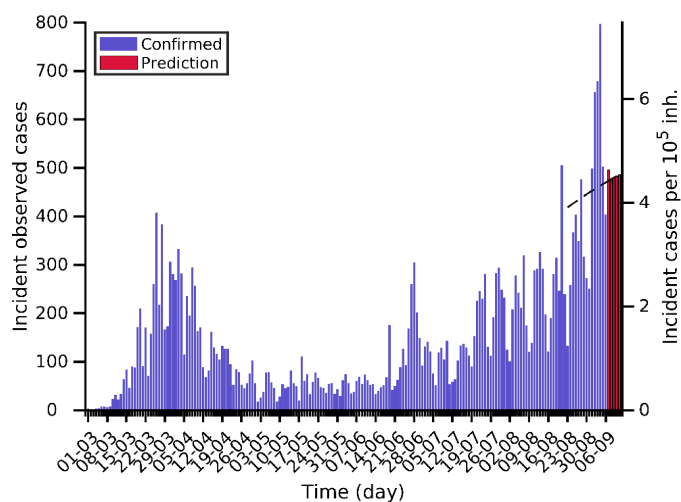


Czech Rep 06-09-2020. Pop: 10.7M. Cumulative incidence: 263/10⁵

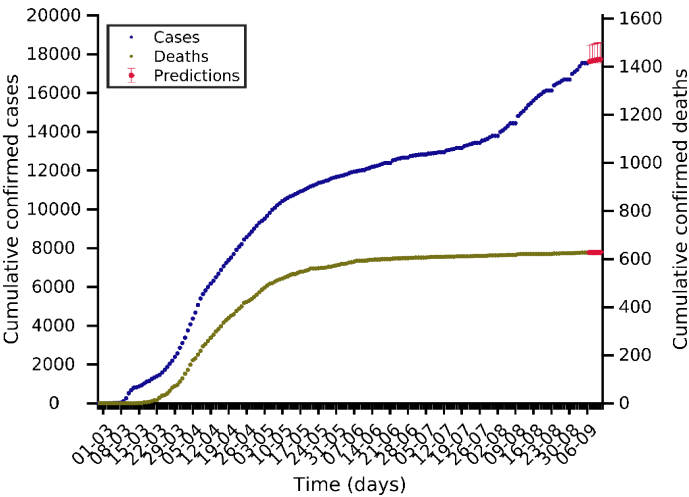


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	28652 (+496)	[28156 - 30042]
09-09-2020	29609 (+480)	[28159 - 31059]
11-09-2020	30578 (+486)	[28994 - 32162]

Current indicators		
A_{14}	EPG	CFR
58	85	0.75 %

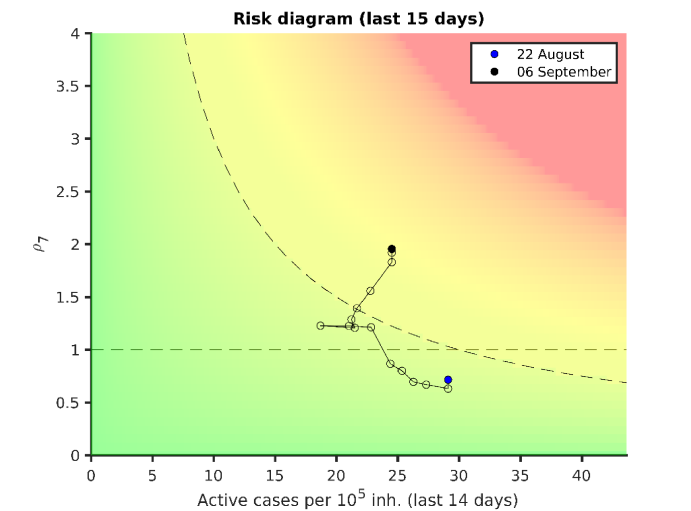
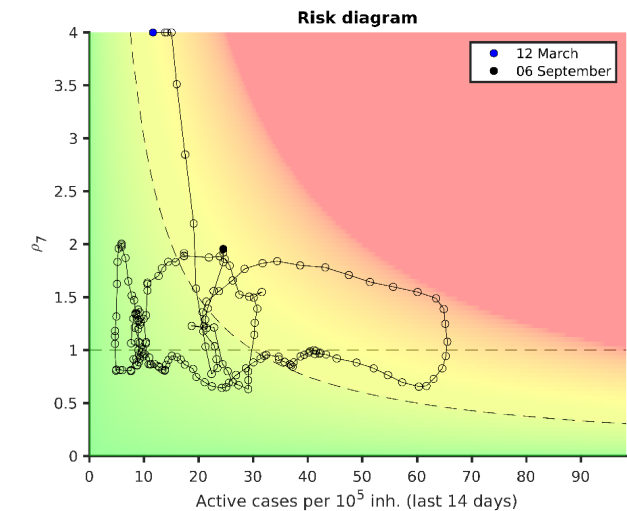
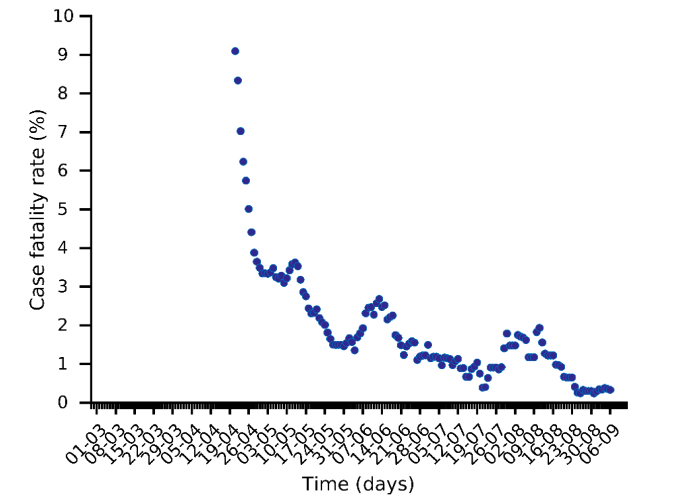
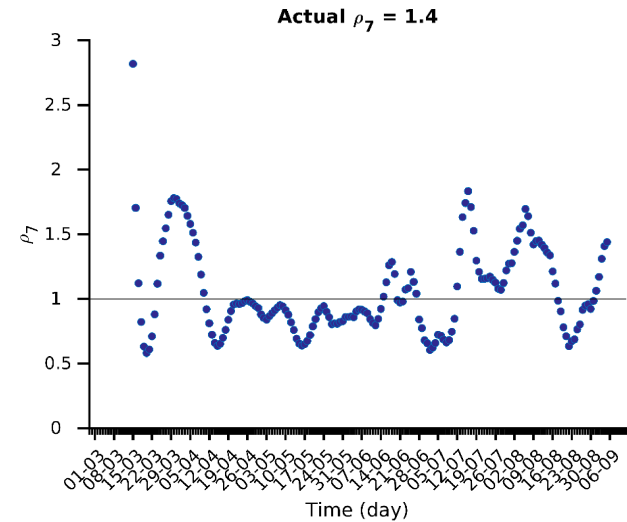
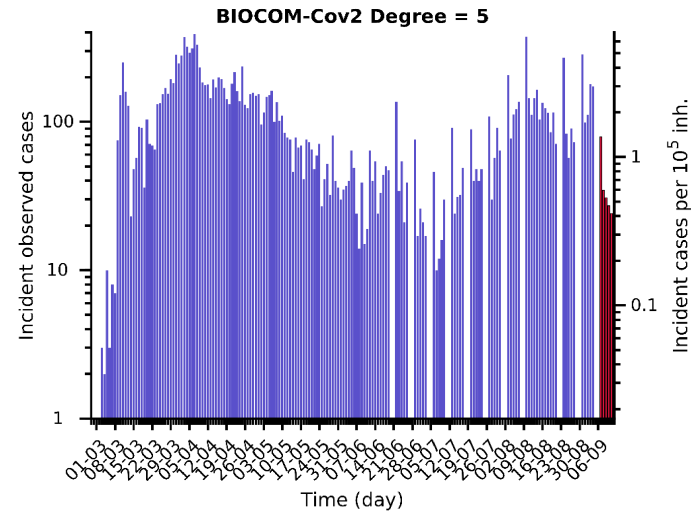
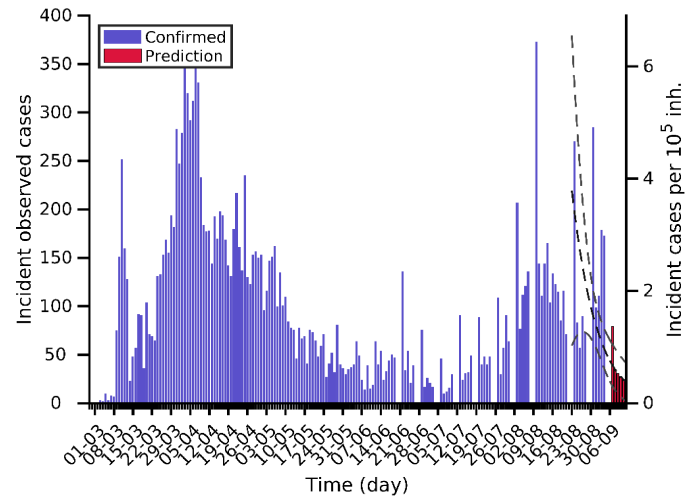


Denmark 06-09-2020. Pop: 5.8M. Cumulative incidence: 303/10⁵

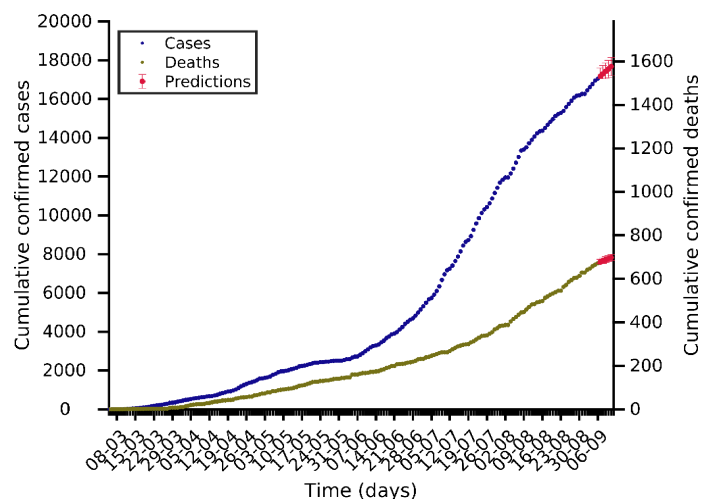


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	17626 (+79)	[17547 - 18465]
09-09-2020	17691 (+31)	[17547 - 18542]
11-09-2020	17743 (+24)	[17547 - 18611]

Current indicators		
A ₁₄	EPG	CFR
25	35	0.33 %



Bulgaria 06-09-2020. Pop: 6.9M. Cumulative incidence: 245/10⁵

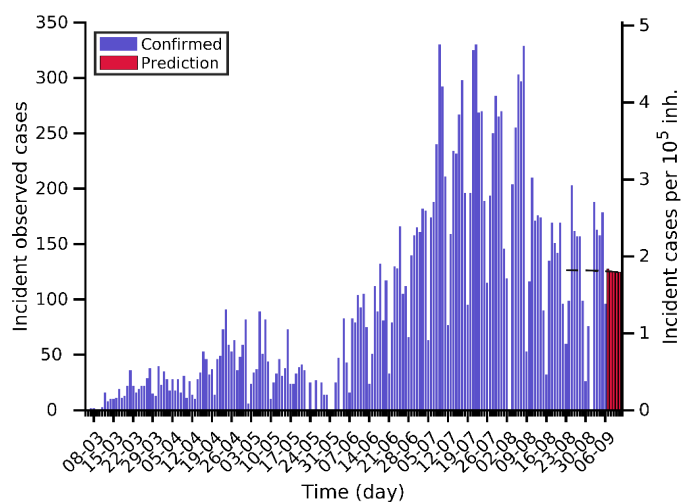


Predictions for next days

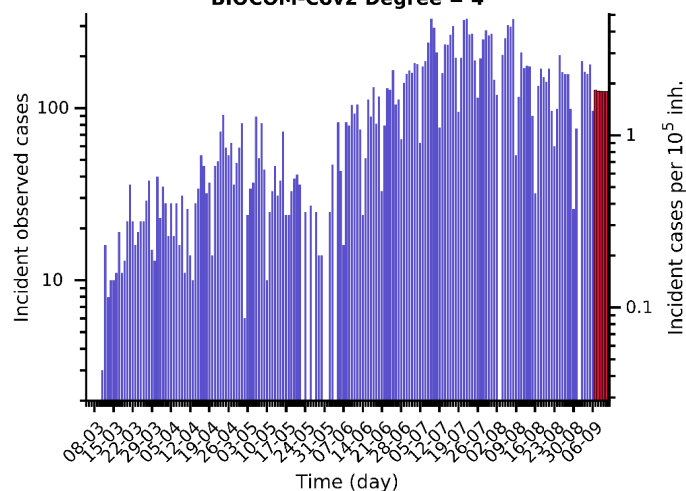
Day	Number of cases	95% Confidence Interval
07-09-2020	17177 (+127)	[17050 - 17592]
09-09-2020	17428 (+125)	[17050 - 17859]
11-09-2020	17677 (+125)	[17212 - 18143]

Current indicators

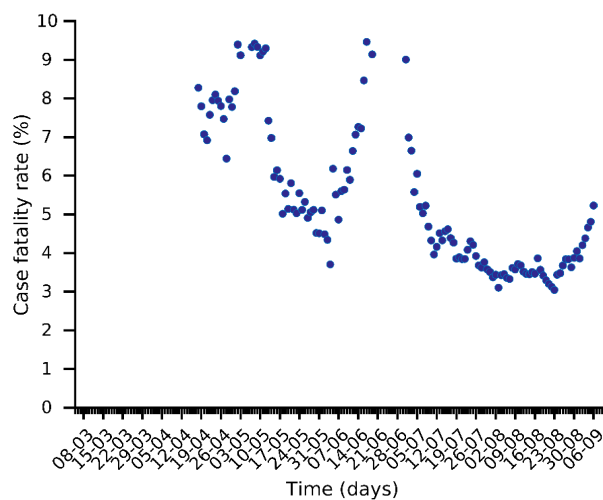
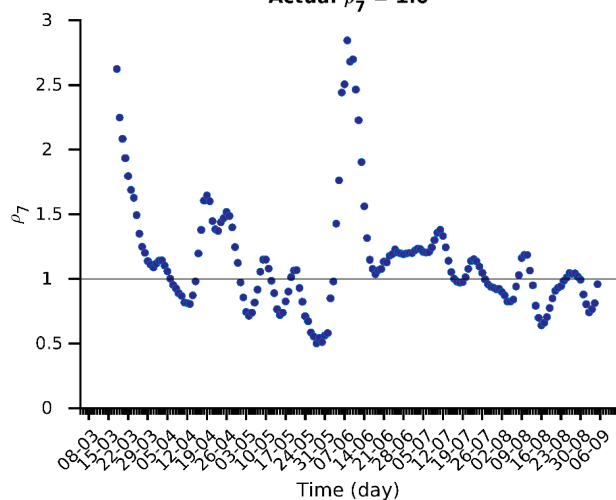
A_{14}	EPG	CFR
25	24	5.23 %



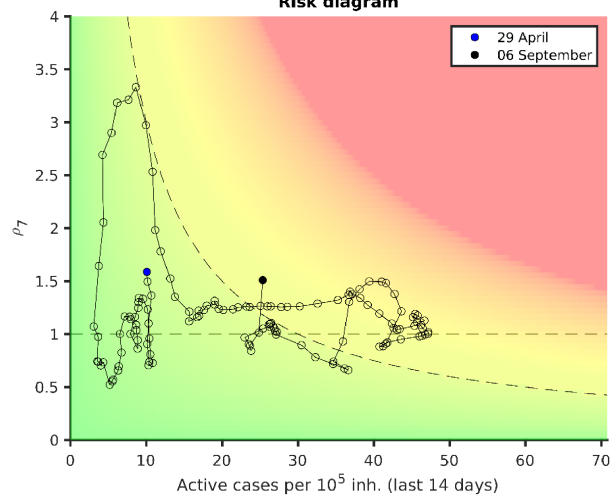
BIOCOM-Cov2 Degree = 4



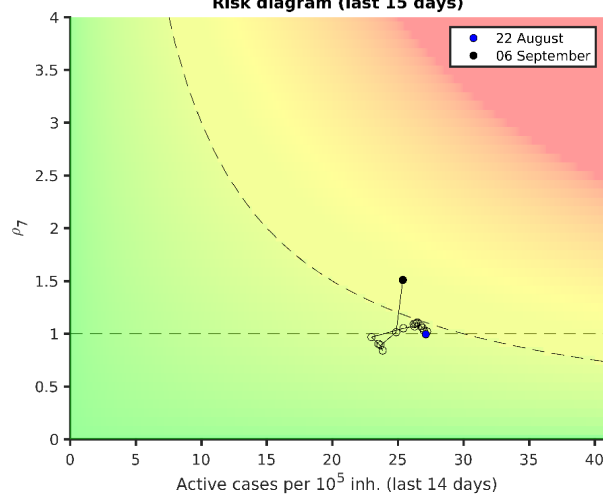
Actual $\rho_7 = 1.0$



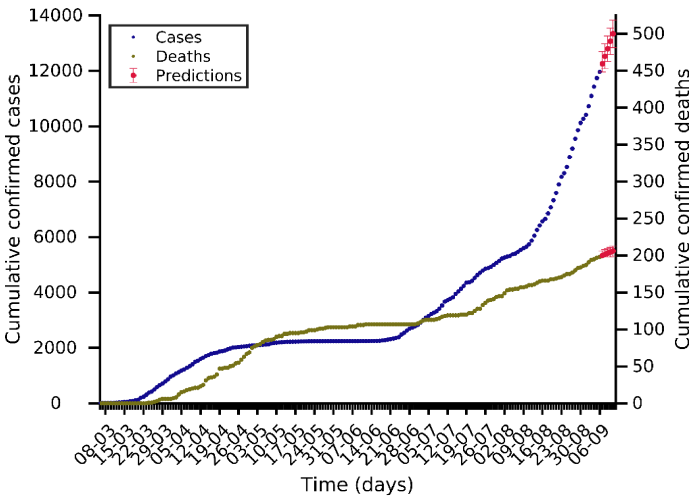
Risk diagram



Risk diagram (last 15 days)

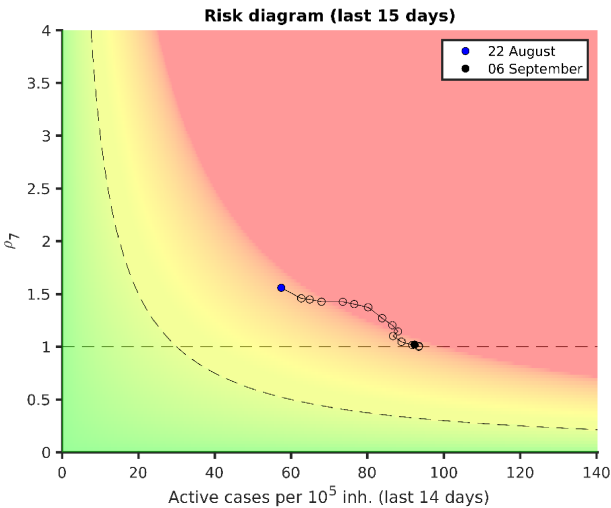
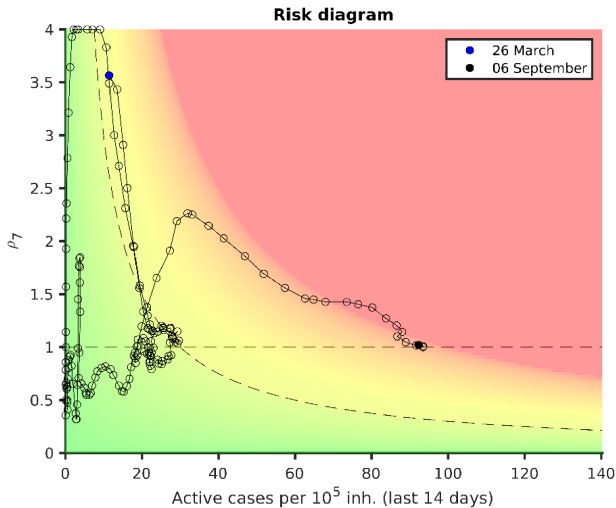
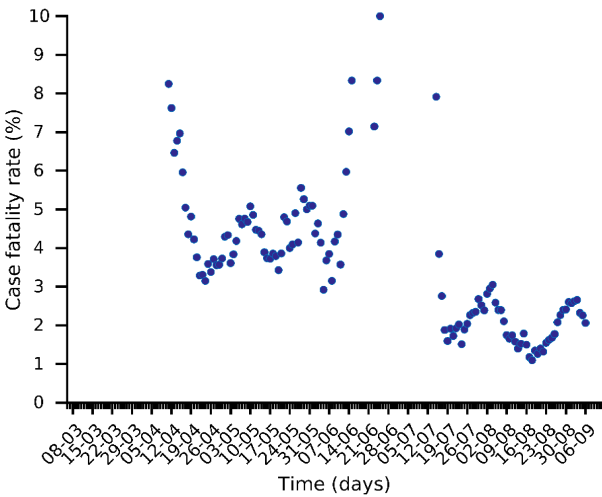
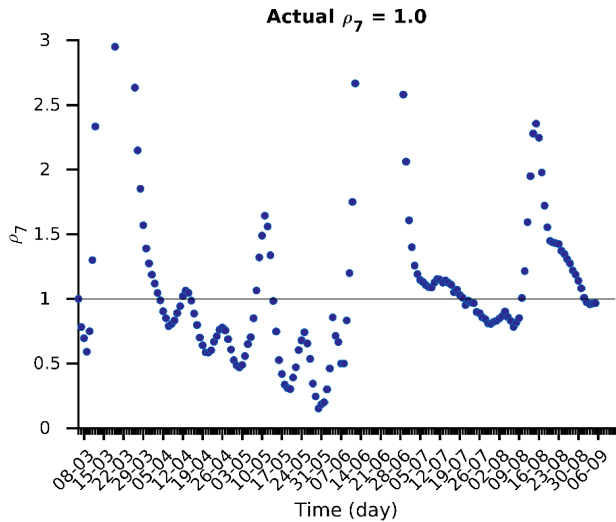
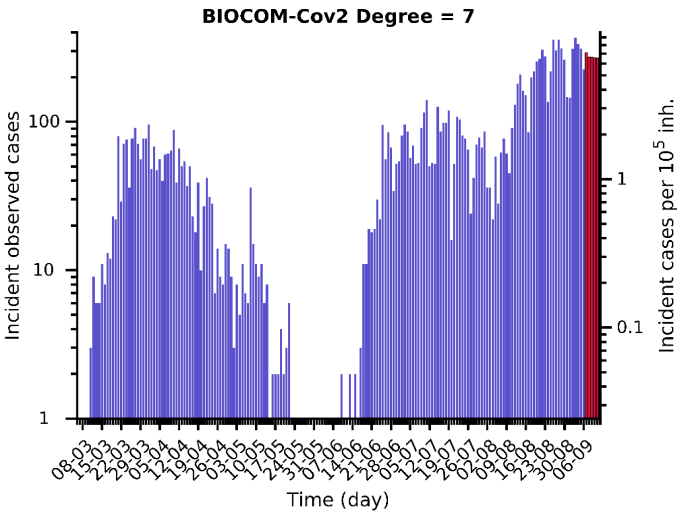
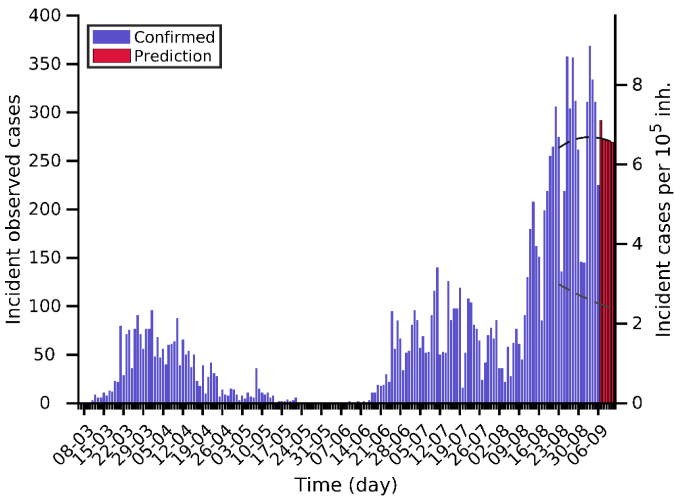


Croatia 06-09-2020. Pop: 4.1M. Cumulative incidence: 291/10⁵

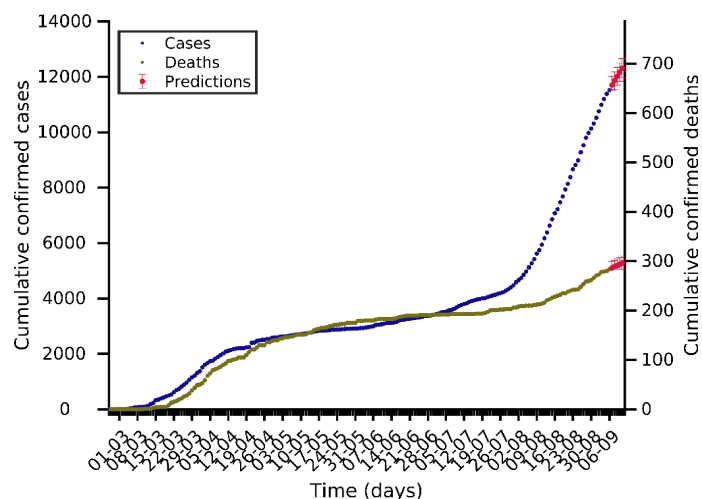


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	12256 (+292)	[11964 - 12697]
09-09-2020	12800 (+272)	[12341 - 13260]
11-09-2020	13340 (+269)	[12841 - 13839]

Current indicators		
A_{14}	EPG	CFR
92	89	2.06 %

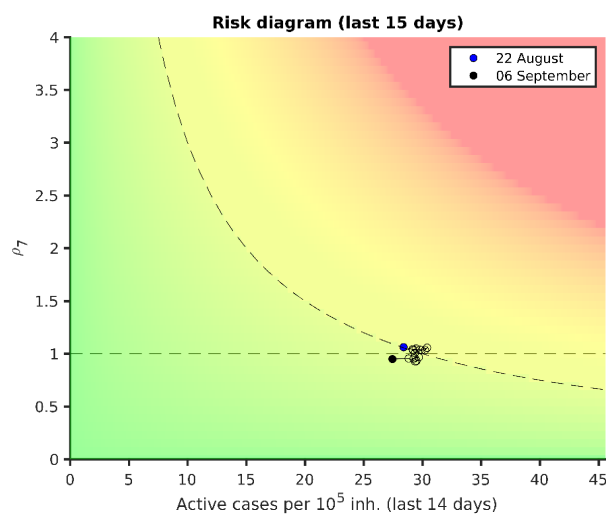
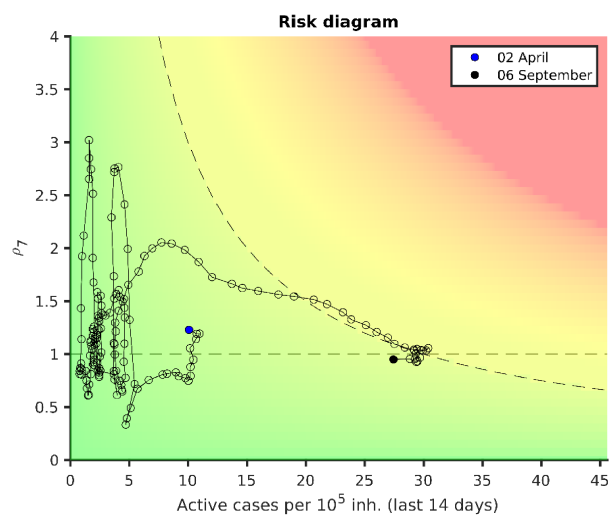
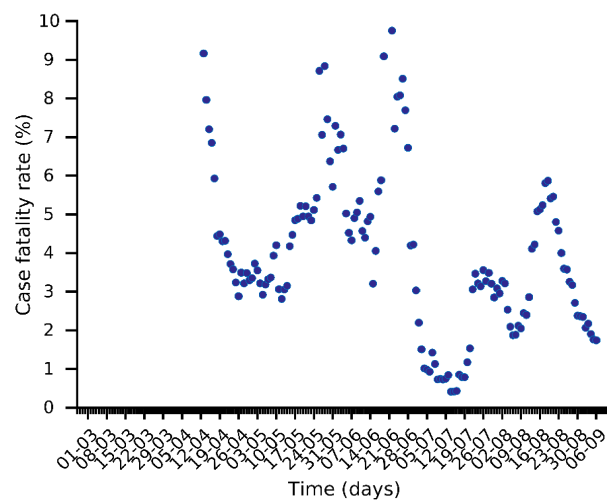
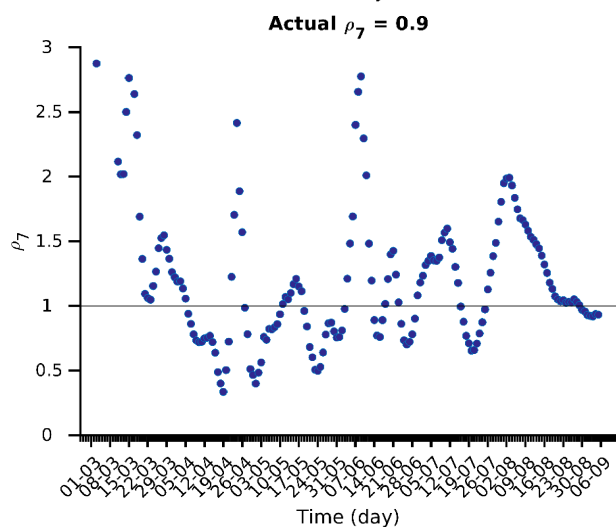
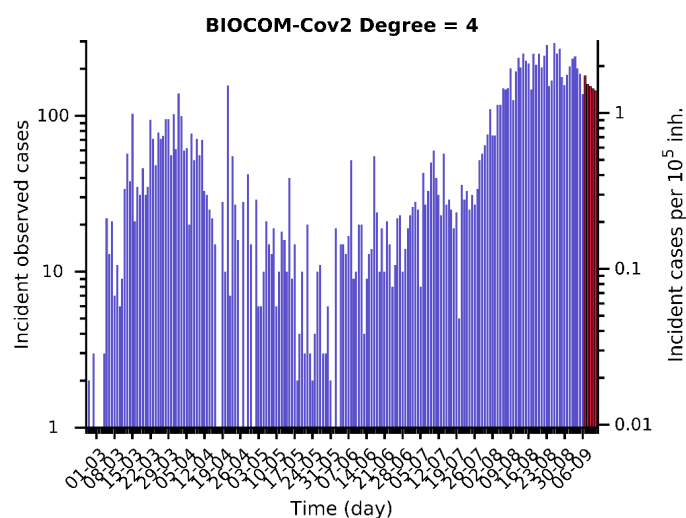
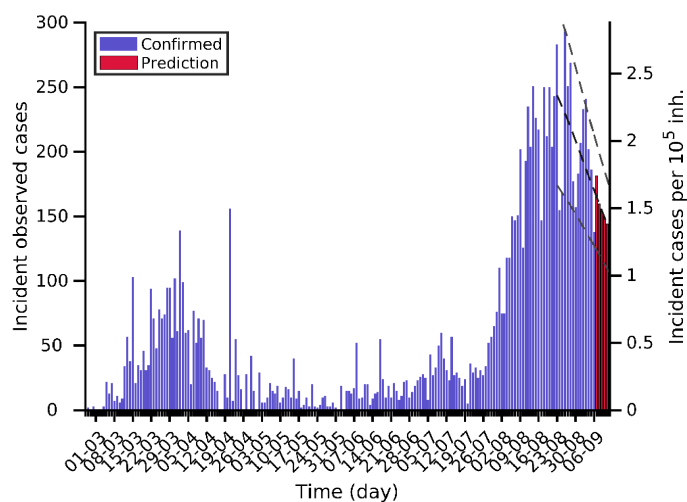


Greece 06-09-2020. Pop: 10.4M. Cumulative incidence: 111/10⁵

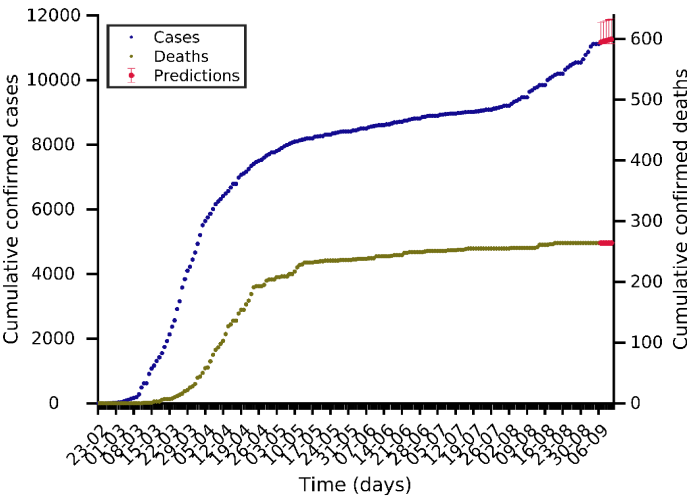


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	11705 (+181)	[11524 - 12021]
09-09-2020	12019 (+154)	[11693 - 12345]
11-09-2020	12312 (+144)	[11966 - 12659]

Current indicators		
A_{14}	EPG	CFR
27	26	1.74 %

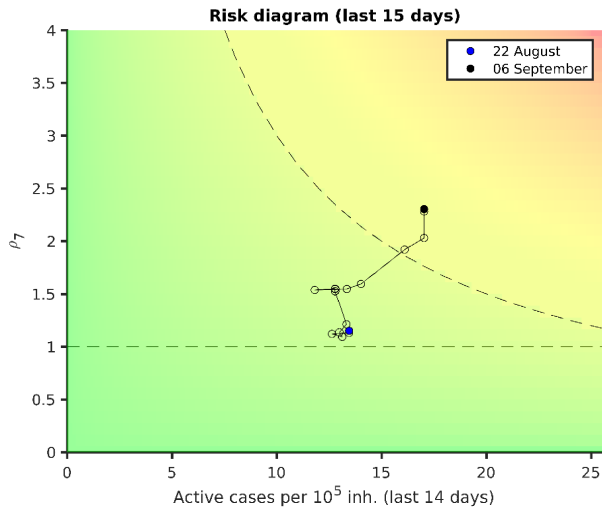
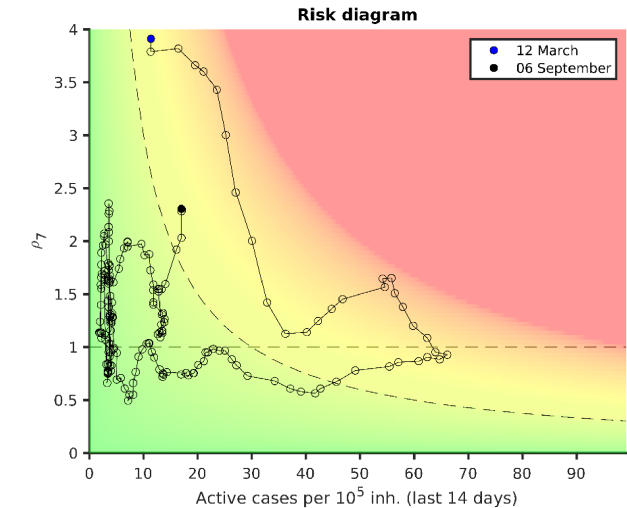
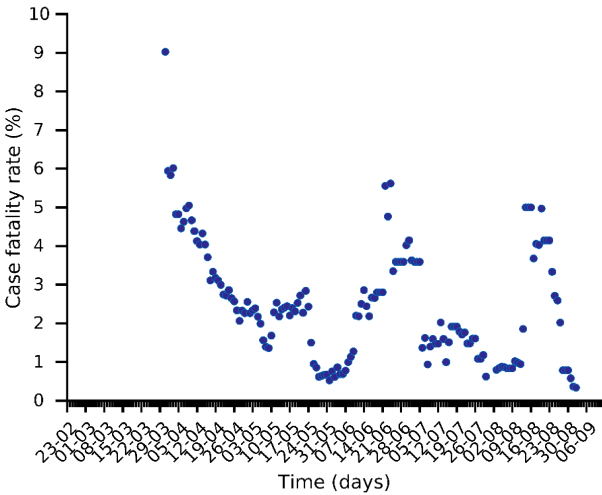
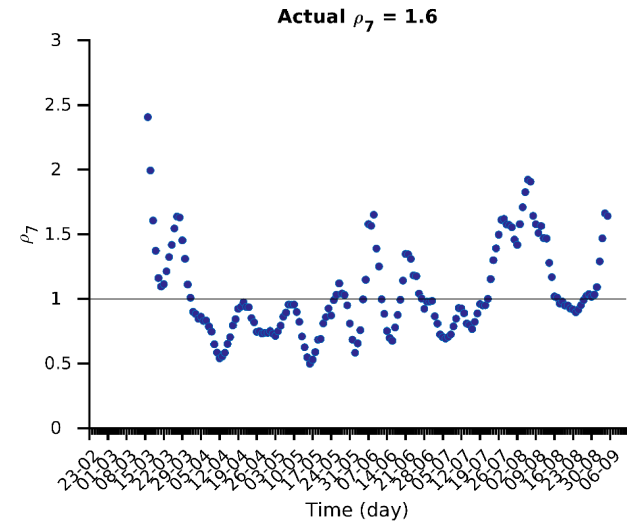
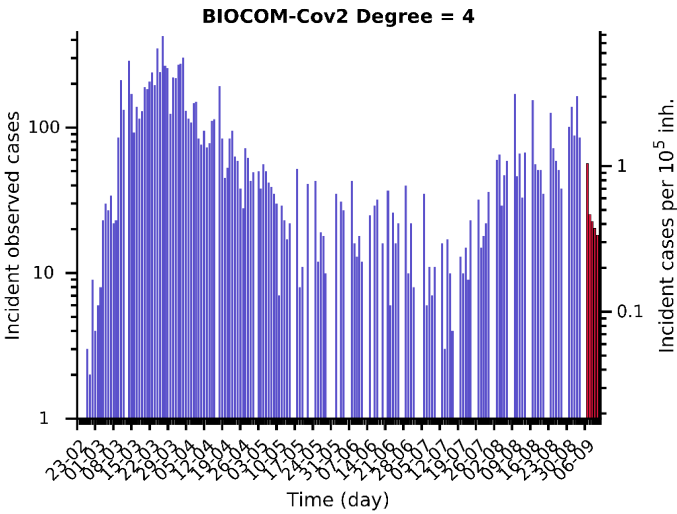
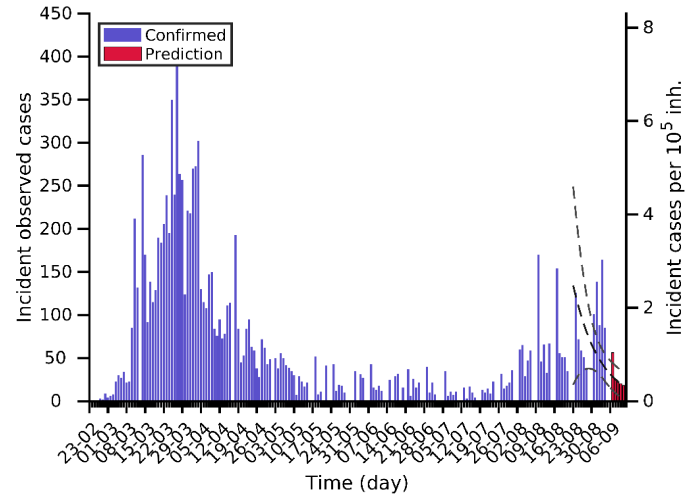


Norway 06-09-2020. Pop: 5.4M. Cumulative incidence: 205/10⁵

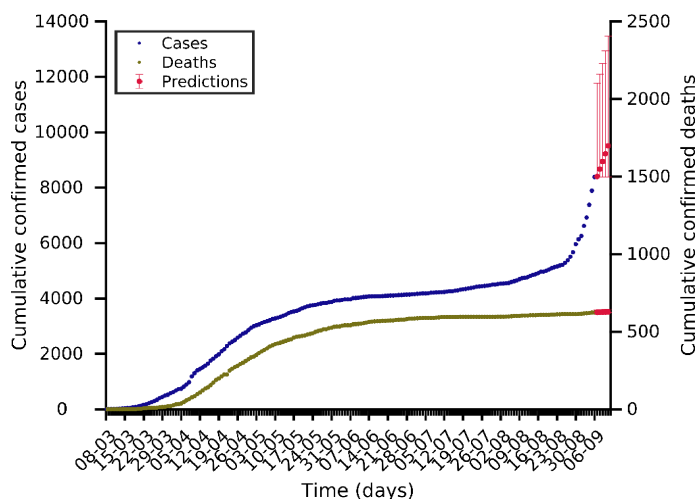


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	11177 (+57)	[11120 - 11783]
09-09-2020	11224 (+23)	[11120 - 11841]
11-09-2020	11263 (+18)	[11120 - 11894]

Current indicators		
A ₁₄	EPG	CFR
17	28	0.00 %

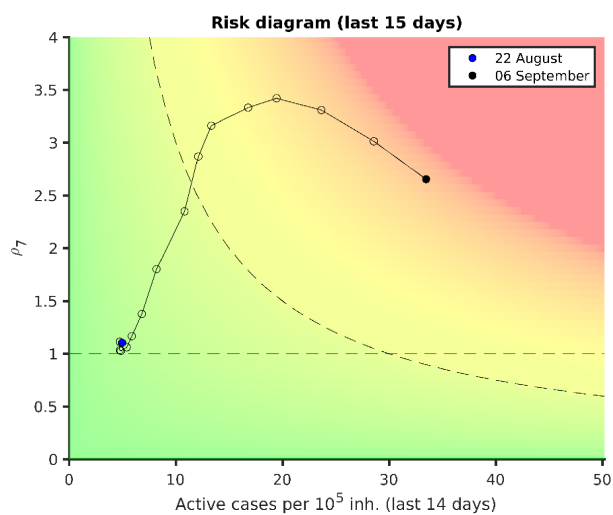
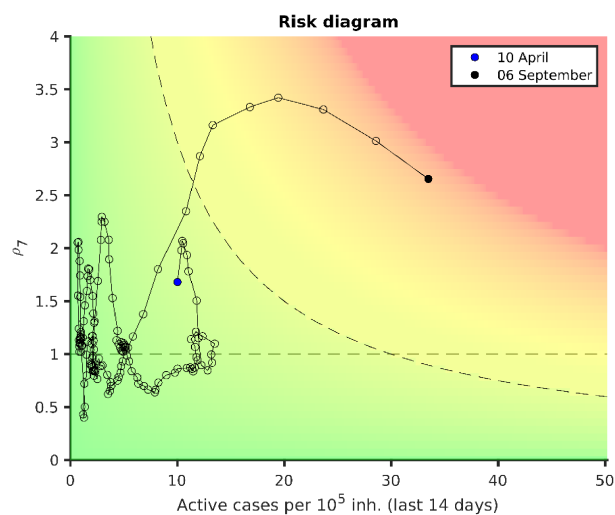
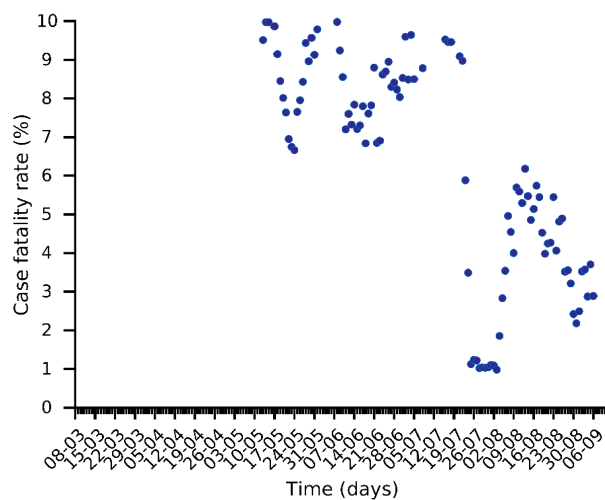
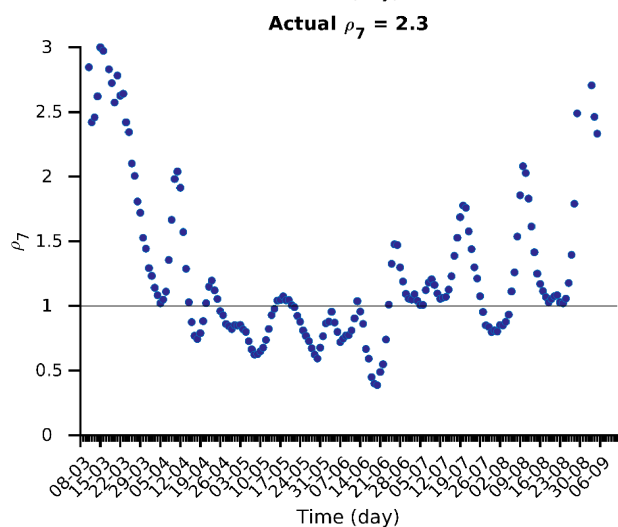
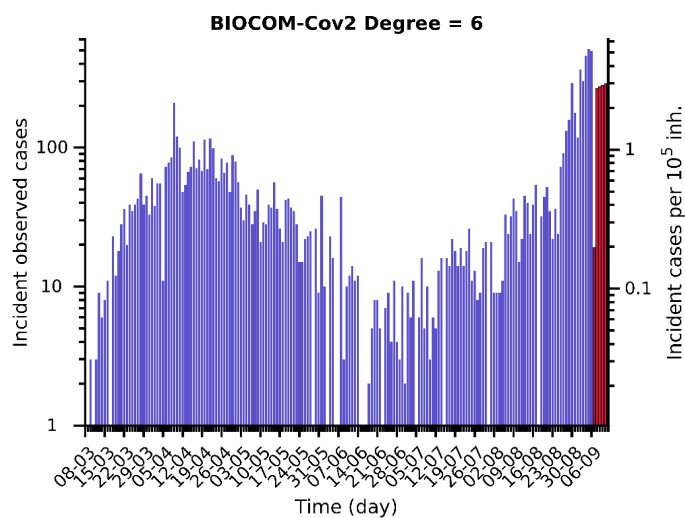
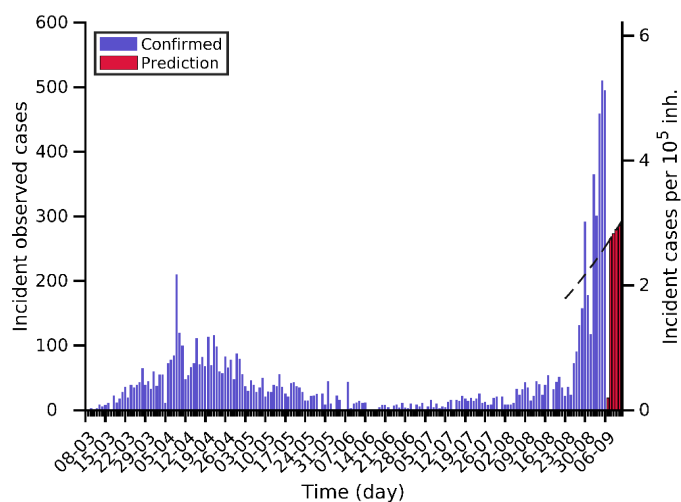


Hungary 06-09-2020. Pop: 9.7M. Cumulative incidence: 87/10⁵

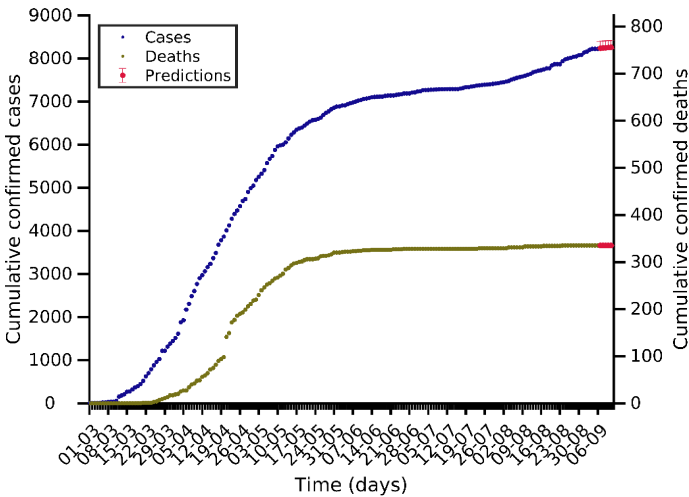


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	8406 (+19)	[8387 - 11768]
09-09-2020	8945 (+273)	[8387 - 12483]
11-09-2020	9512 (+287)	[8387 - 13470]

Current indicators		
A_{14}	EPG	CFR
33	78	2.89 %

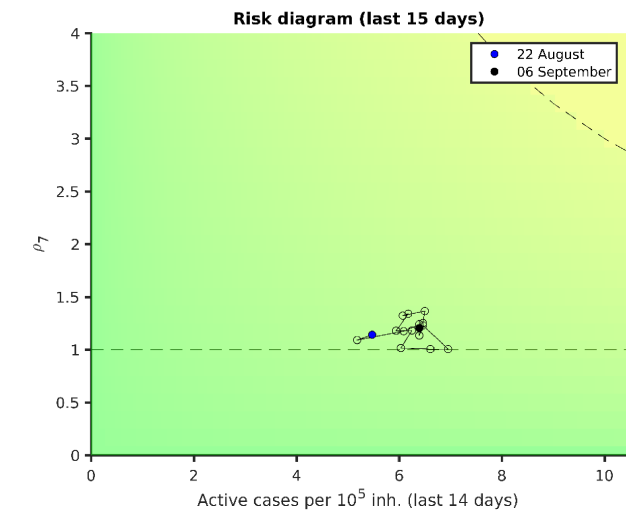
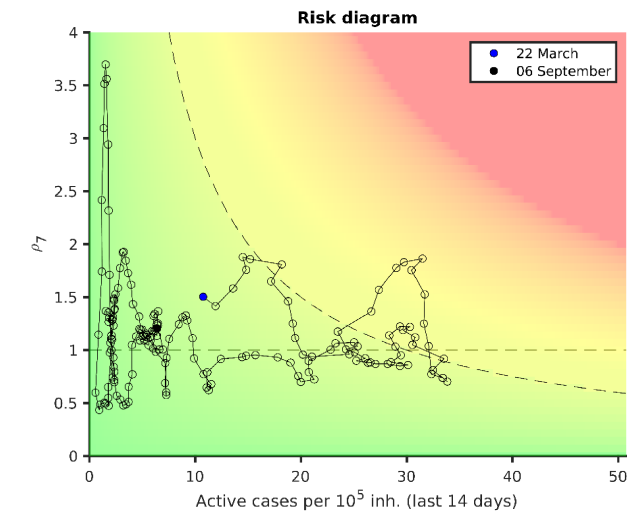
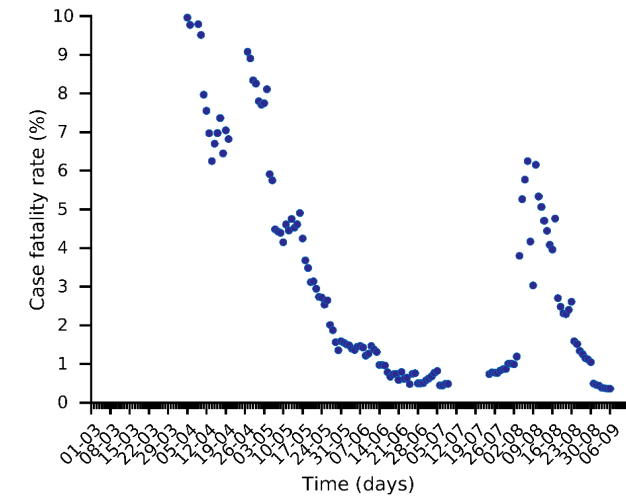
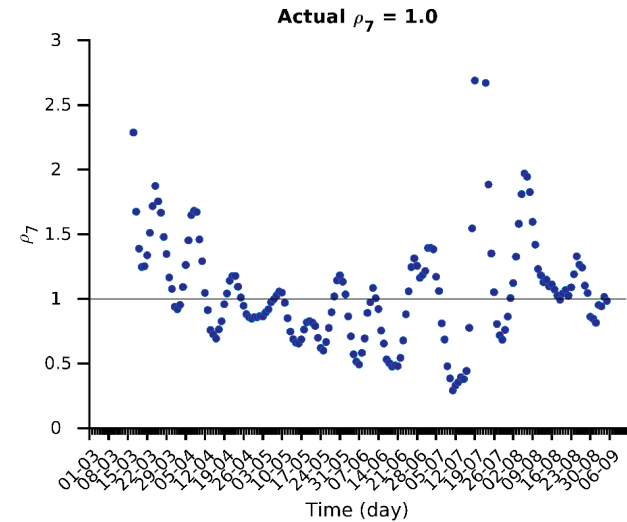
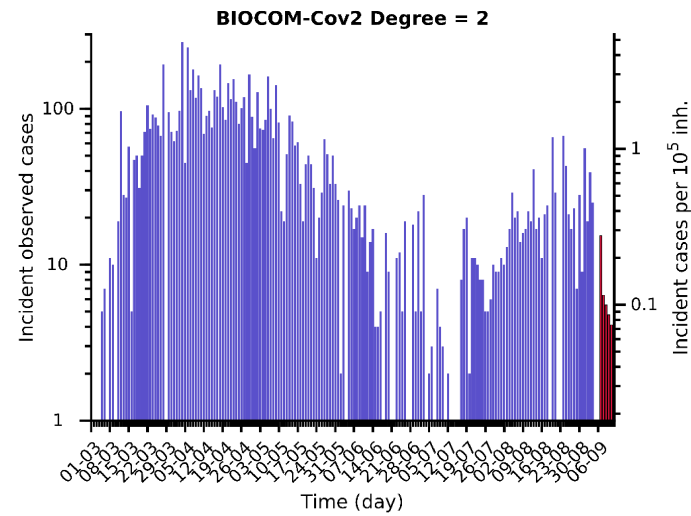
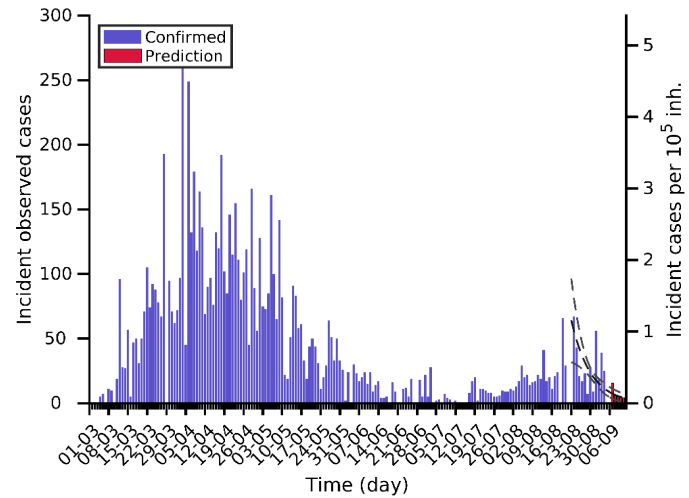


Finland 06-09-2020. Pop: 5.5M. Cumulative incidence: 148/10⁵

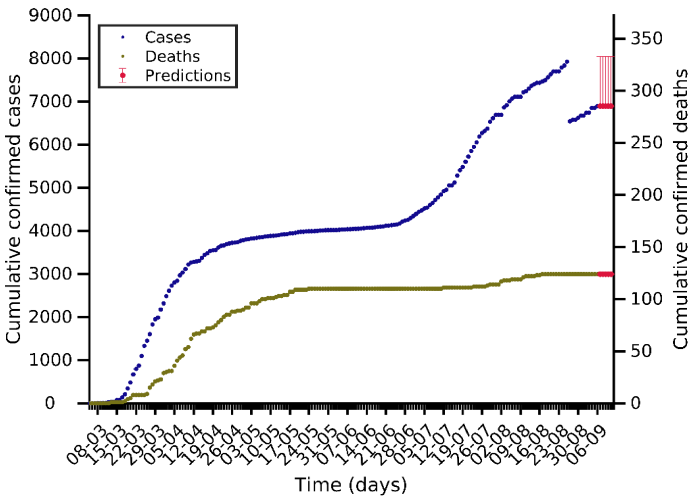


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	8240 (+15)	[8225 - 8398]
09-09-2020	8252 (+6)	[8225 - 8412]
11-09-2020	8261 (+4)	[8225 - 8423]

Current indicators		
A ₁₄	EPG	CFR
6	6	0.36 %

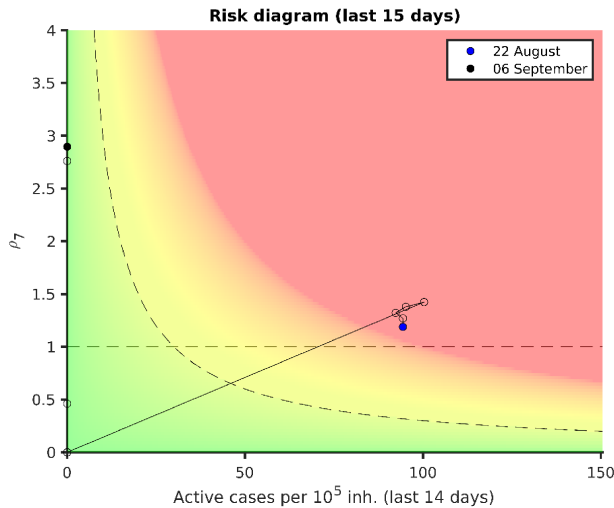
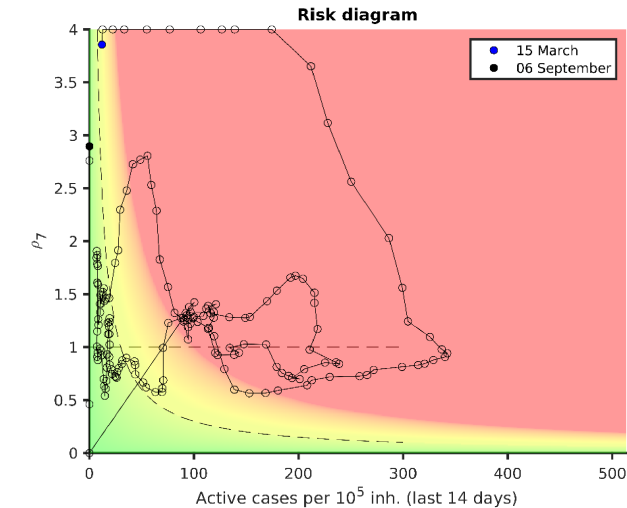
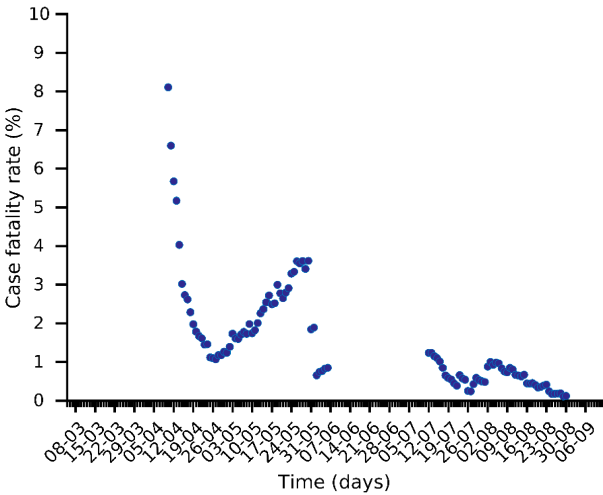
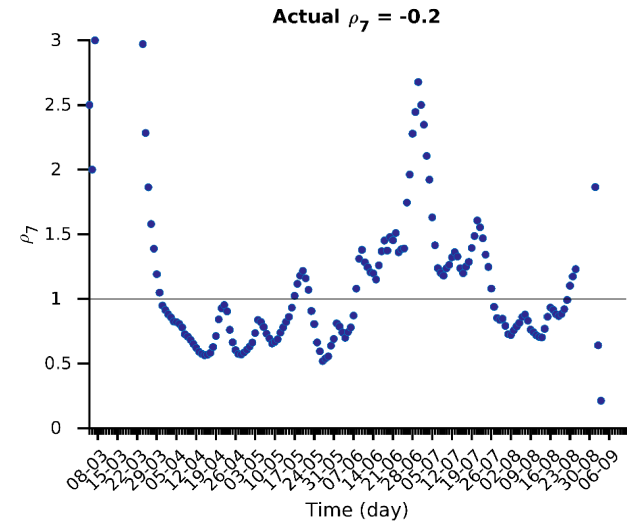
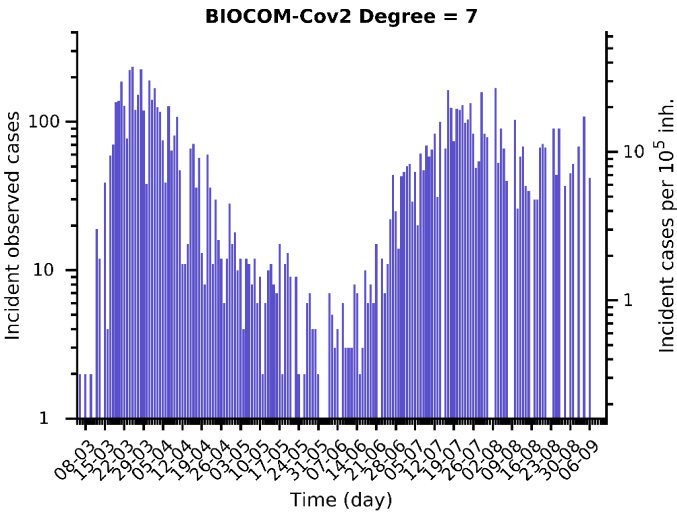
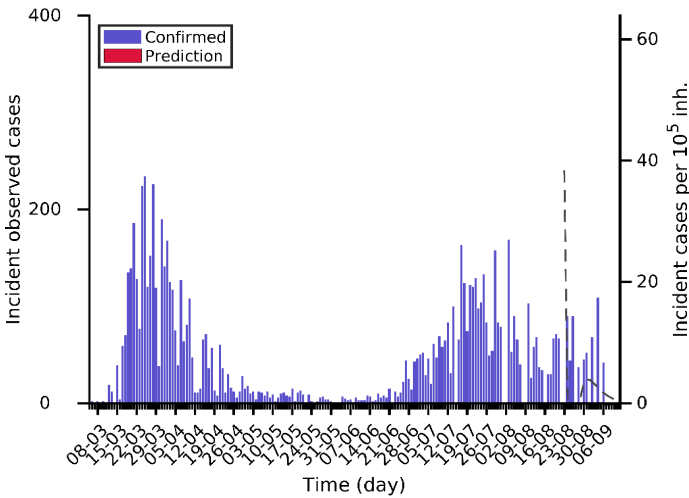


Luxembourg 06-09-2020. Pop: 0.6M. Cumulative incidence: 1102/10⁵

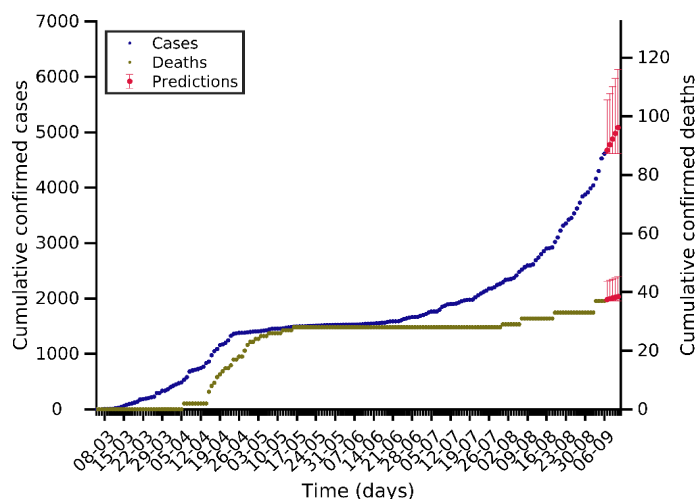


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	6896 (+0)	[6896 - 8048]
09-09-2020	6896 (+0)	[6896 - 8046]
11-09-2020	6896 (+0)	[6896 - 8046]

Current indicators		
A ₁₄	EPG	CFR
-129	31	0.00 %



Slovakia 06-09-2020. Pop: 5.5M. Cumulative incidence: 85/10⁵

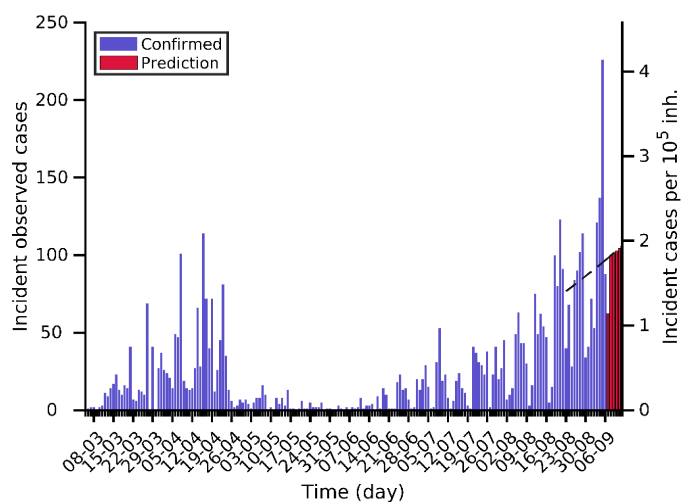


Predictions for next days

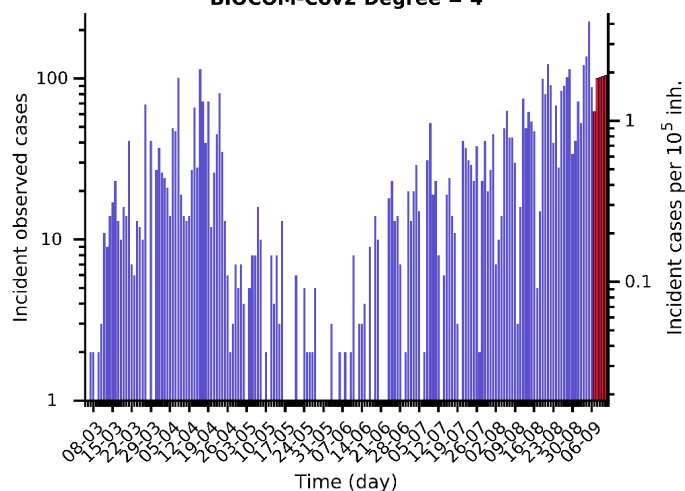
Day	Number of cases	95% Confidence Interval
07-09-2020	4676 (+62)	[4614 - 5584]
09-09-2020	4877 (+101)	[4614 - 5827]
11-09-2020	5085 (+104)	[4614 - 6132]

Current indicators

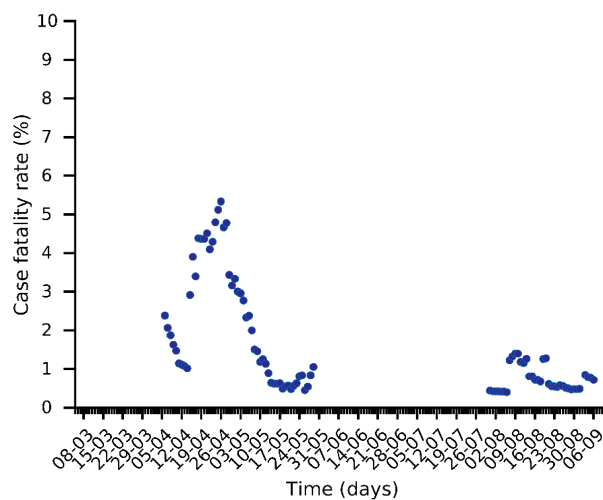
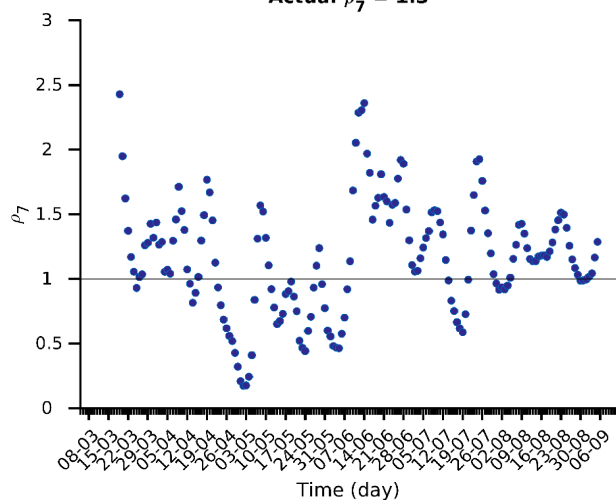
A ₁₄	EPG	CFR
23	30	0.72 %



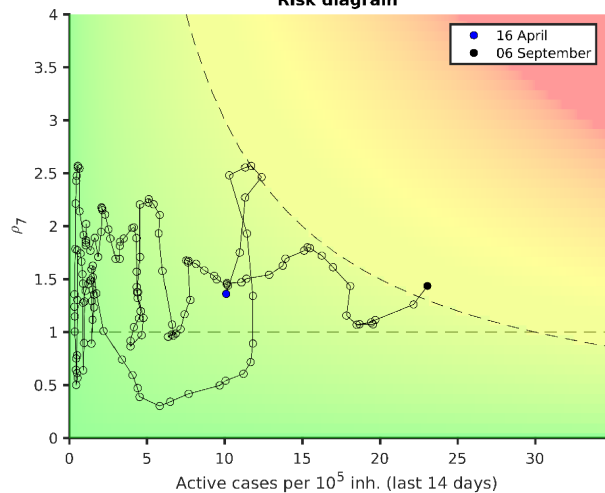
BIOCOM-Cov2 Degree = 4



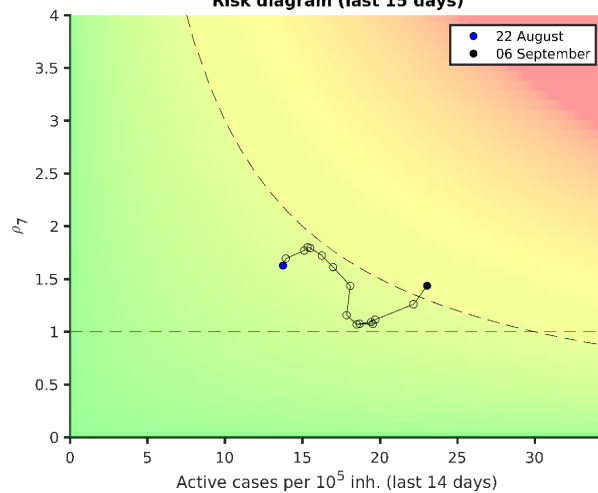
Actual $\rho_7 = 1.3$



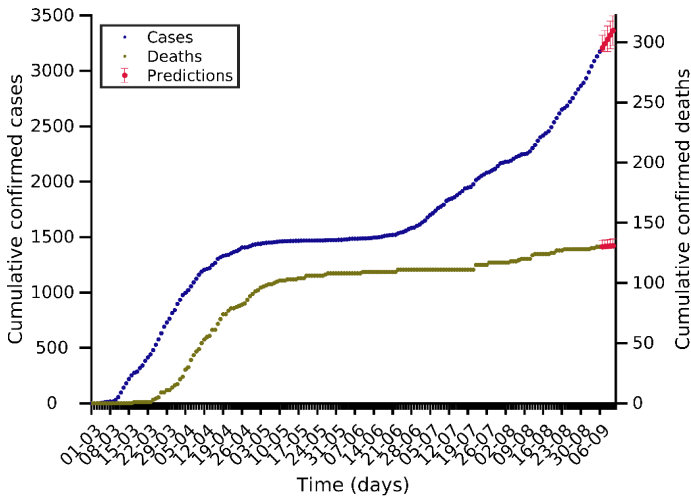
Risk diagram



Risk diagram (last 15 days)

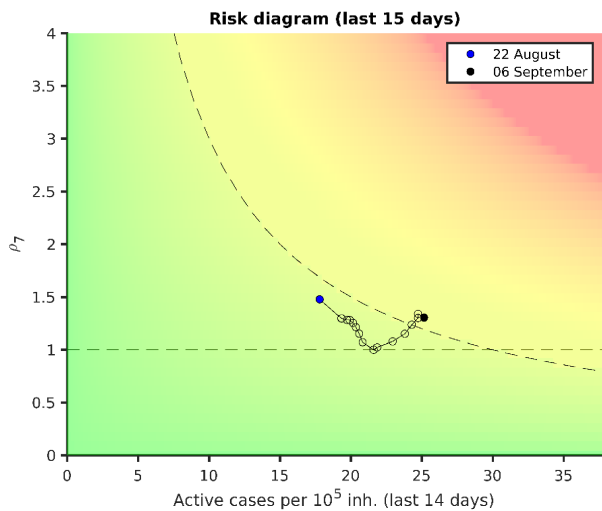
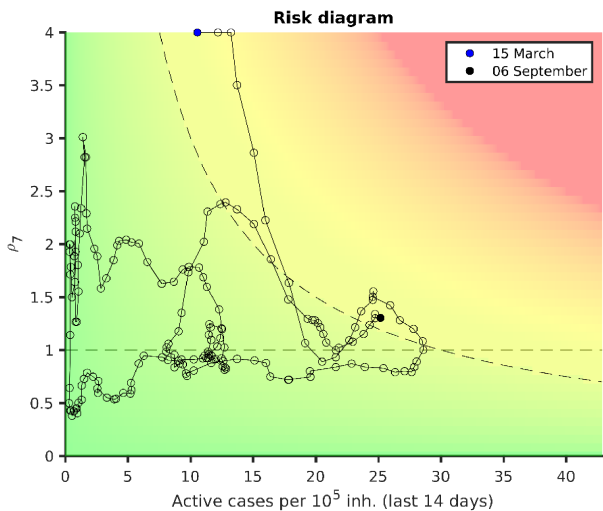
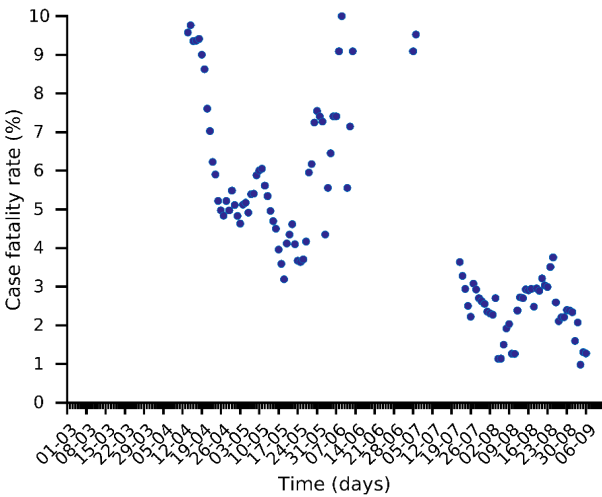
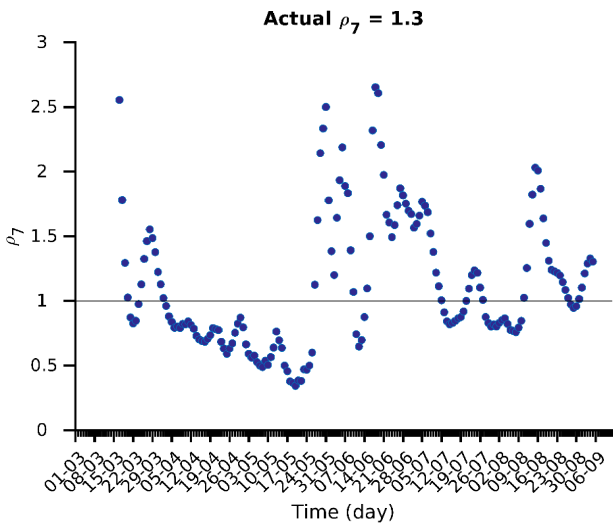
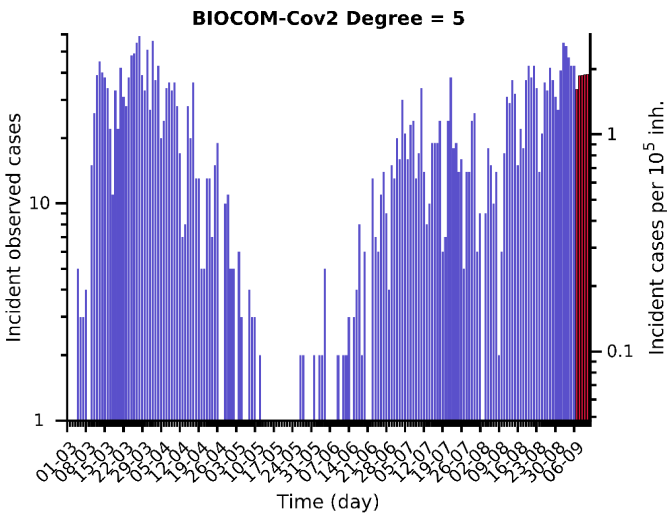
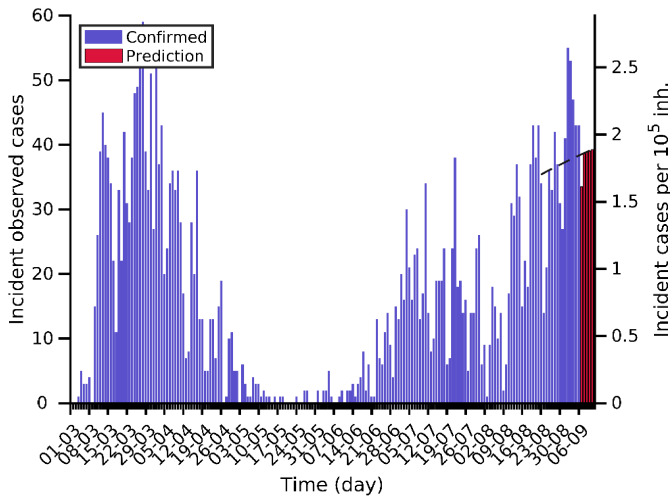


Slovenia 06-09-2020. Pop: 2.1M. Cumulative incidence: 153/10⁵

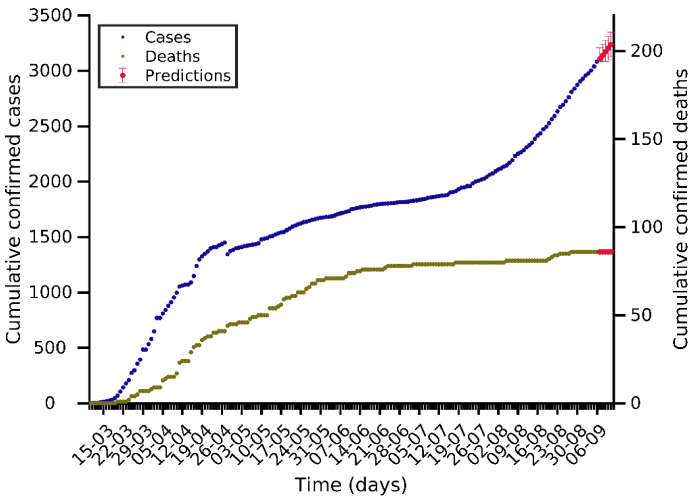


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	3207 (+33)	[3174 - 3324]
09-09-2020	3285 (+39)	[3174 - 3406]
11-09-2020	3363 (+39)	[3232 - 3495]

Current indicators		
A_{14}	EPG	CFR
25	33	1.27 %

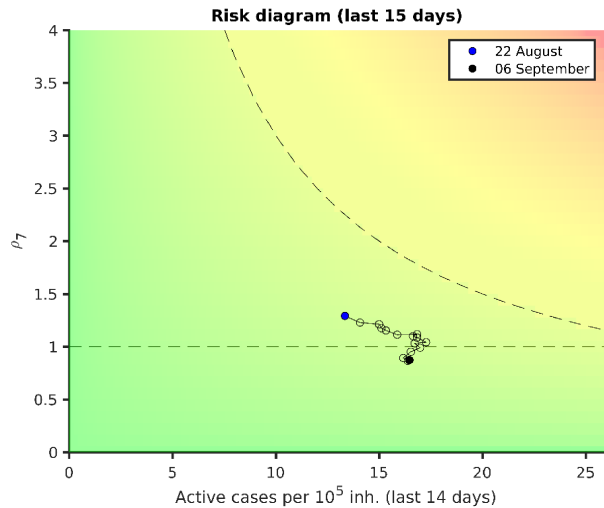
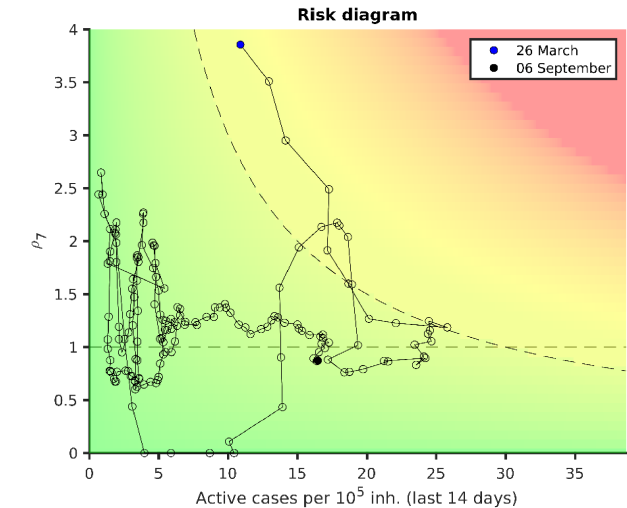
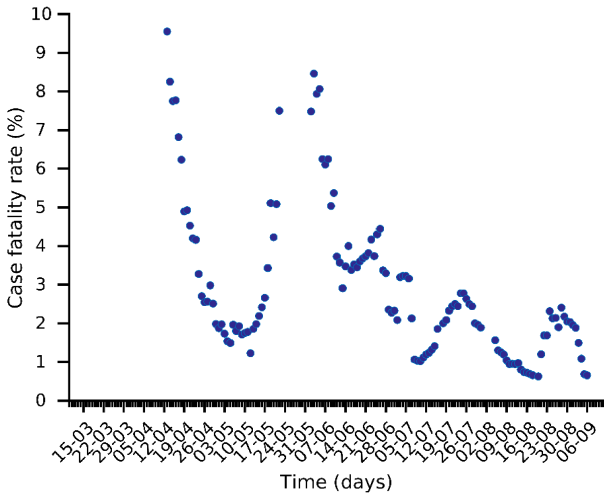
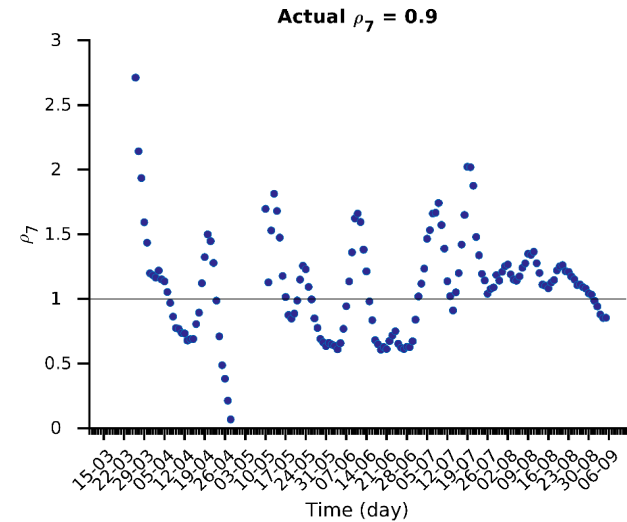
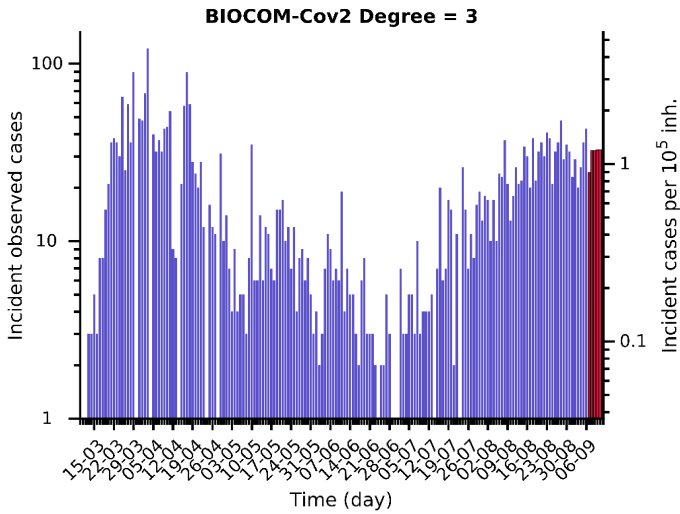
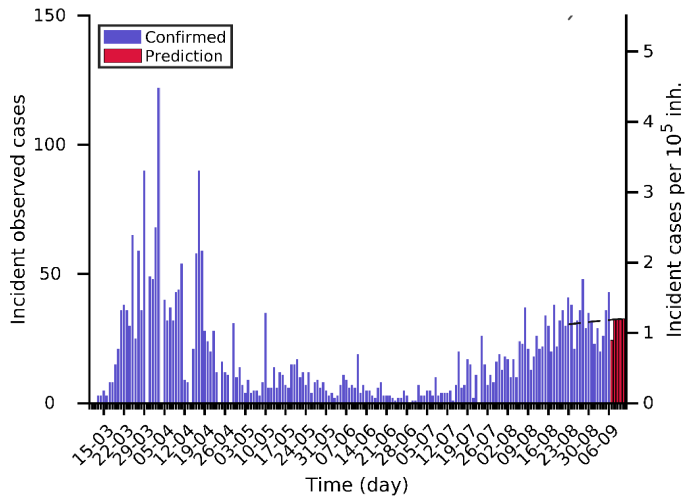


Lithuania 06-09-2020. Pop: 2.7M. Cumulative incidence: 113/10⁵

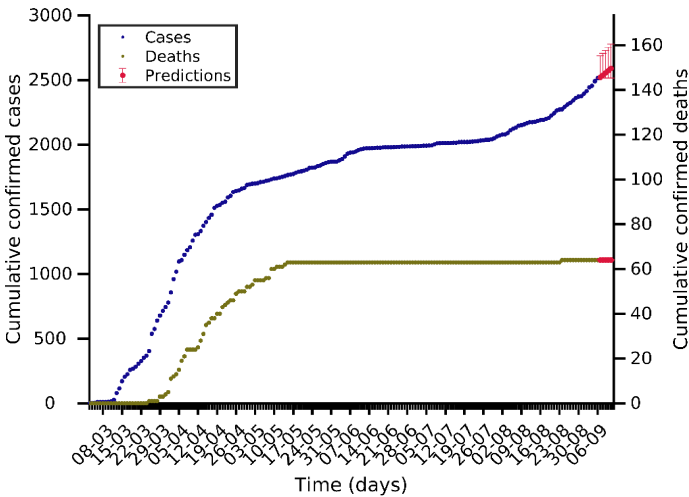


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	3107 (+24)	[3083 - 3207]
09-09-2020	3172 (+32)	[3083 - 3276]
11-09-2020	3237 (+33)	[3125 - 3350]

Current indicators		
A ₁₄	EPG	CFR
16	14	0.65 %

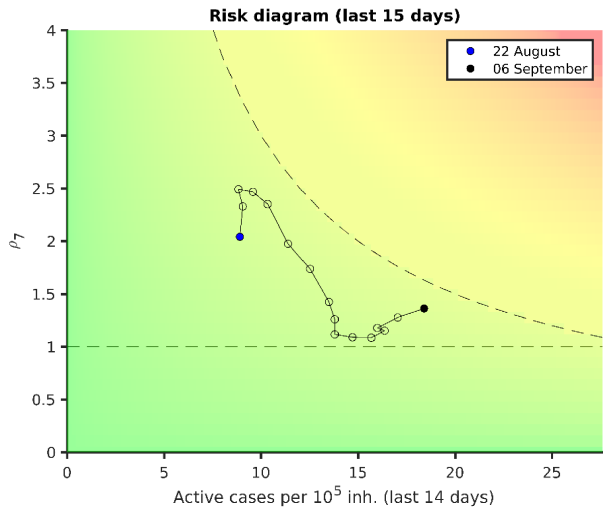
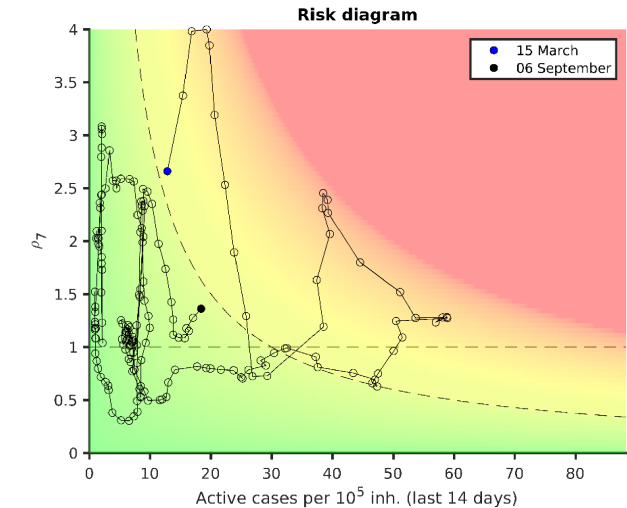
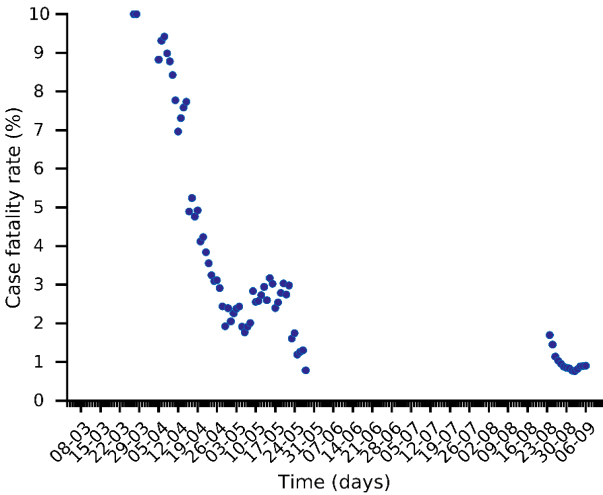
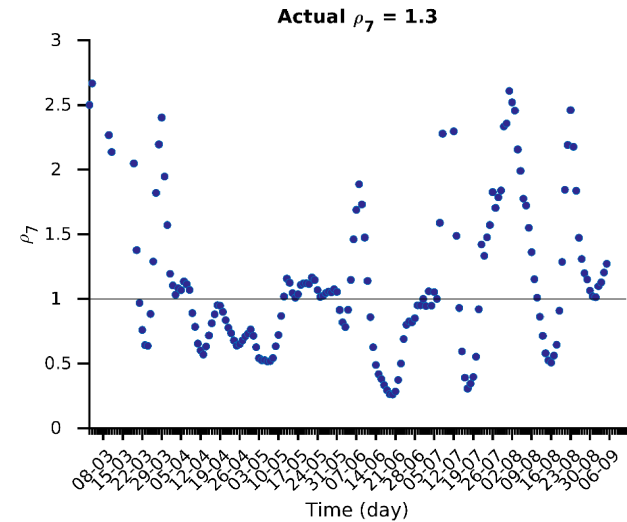
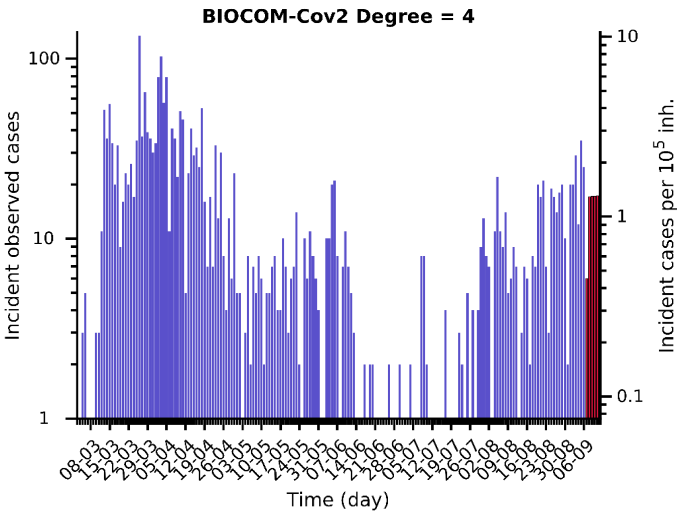
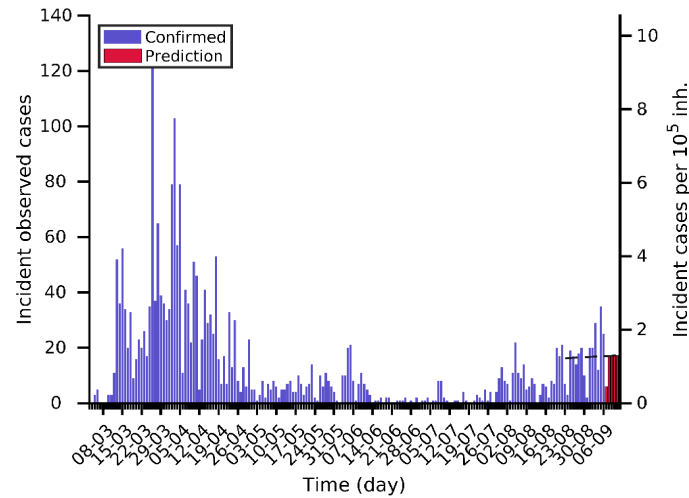


Estonia 06-09-2020. Pop: 1.3M. Cumulative incidence: 190/10⁵

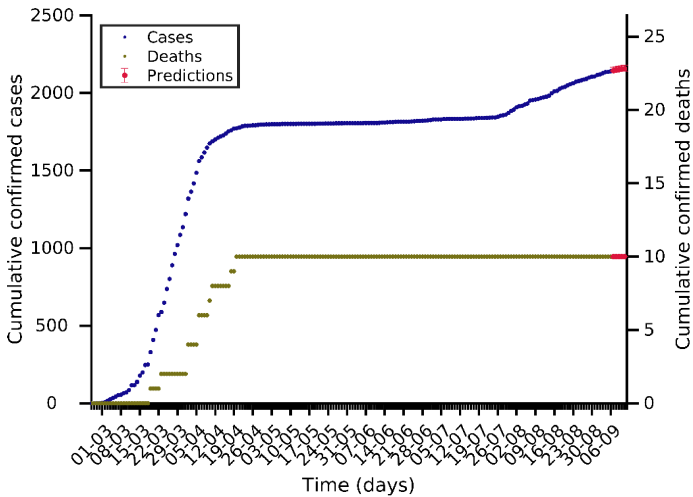


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	2522 (+6)	[2516 - 2688]
09-09-2020	2556 (+17)	[2516 - 2729]
11-09-2020	2591 (+17)	[2516 - 2778]

Current indicators		
A ₁₄	EPG	CFR
18	23	0.90 %

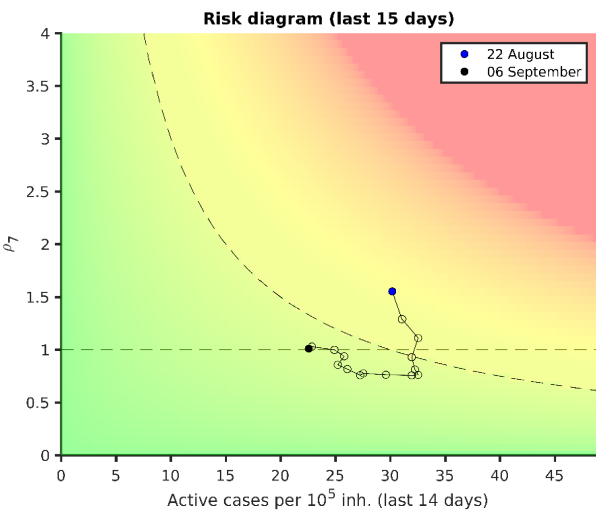
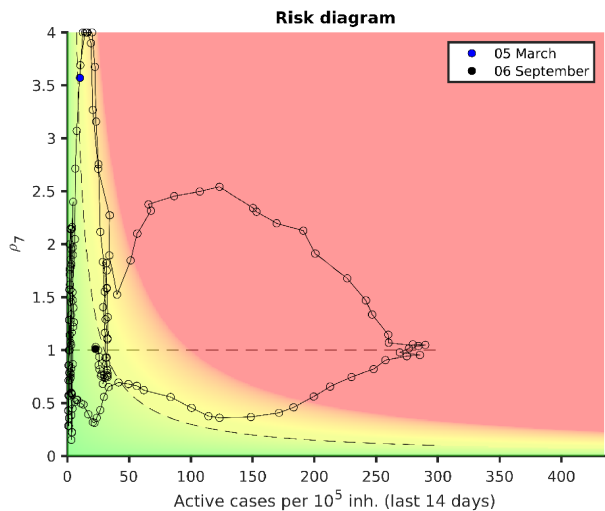
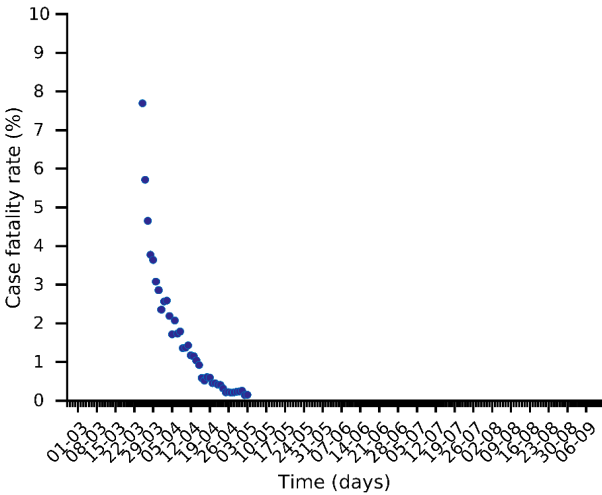
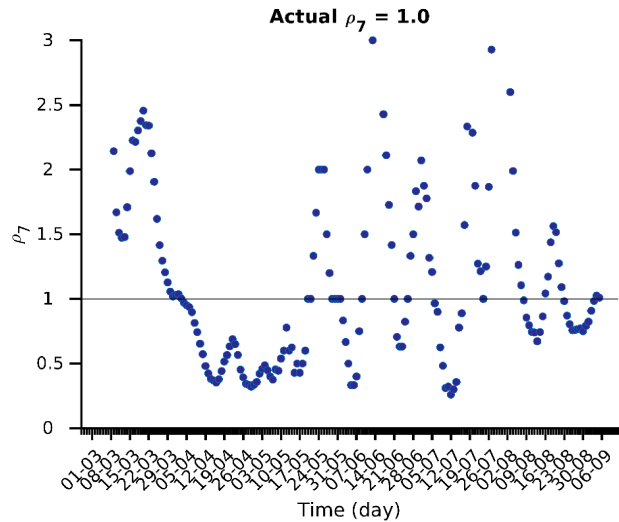
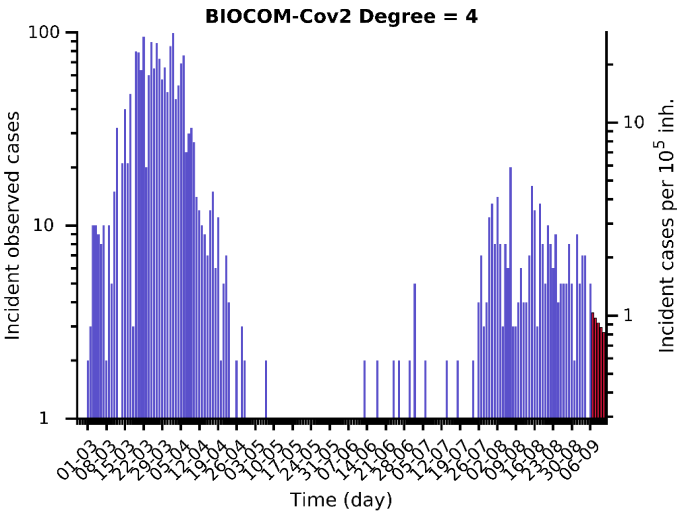
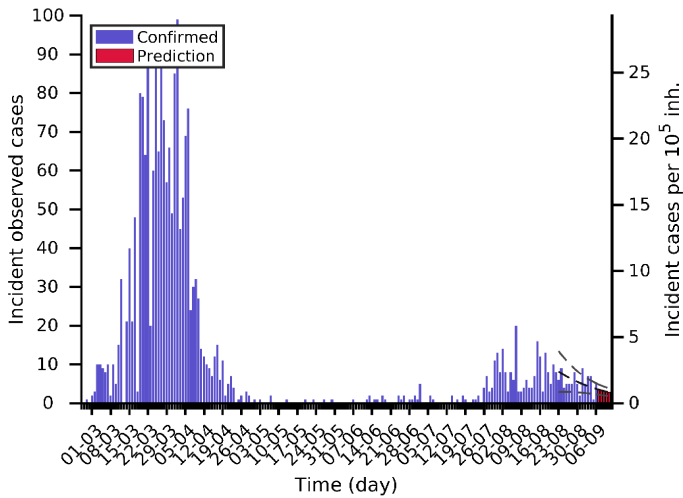


Iceland 06-09-2020. Pop: 0.3M. Cumulative incidence: 627/10⁵

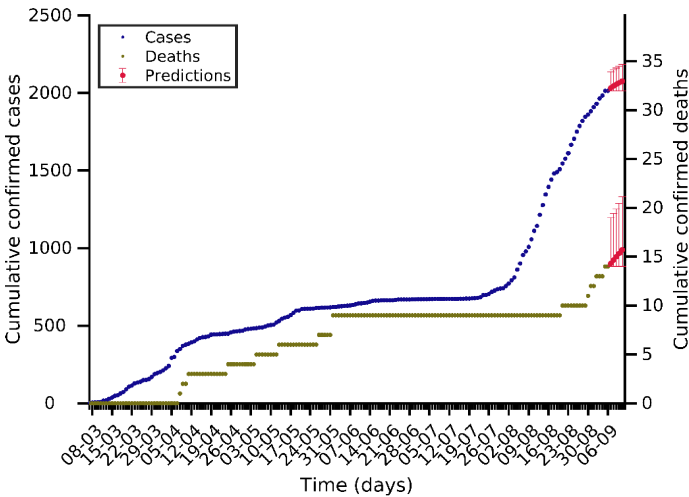


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	2145 (+4)	[2141 - 2166]
09-09-2020	2151 (+3)	[2141 - 2173]
11-09-2020	2157 (+3)	[2141 - 2180]

Current indicators		
A ₁₄	EPG	CFR
23	23	0.00 %

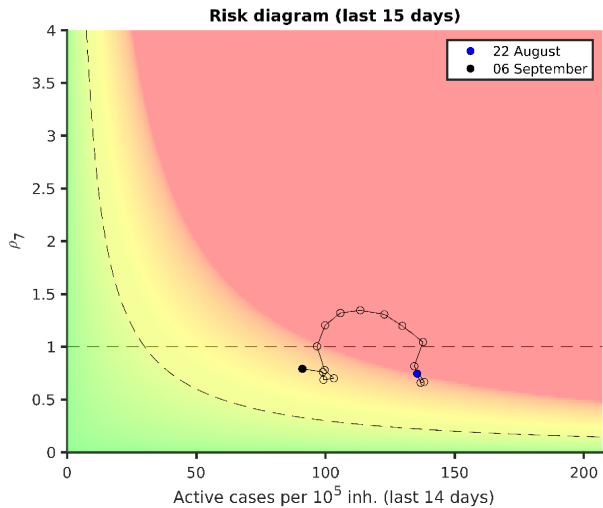
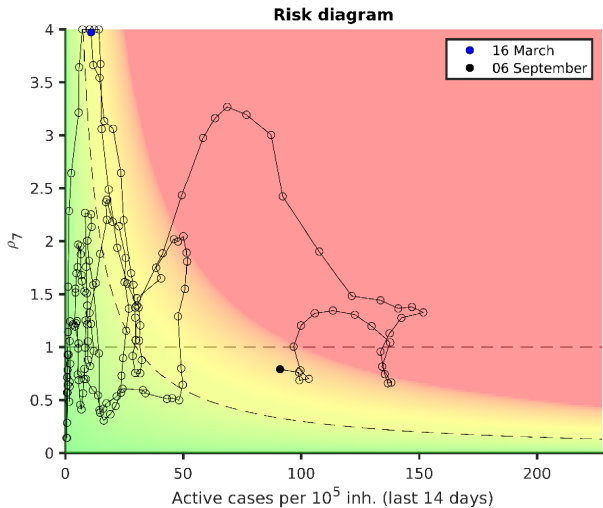
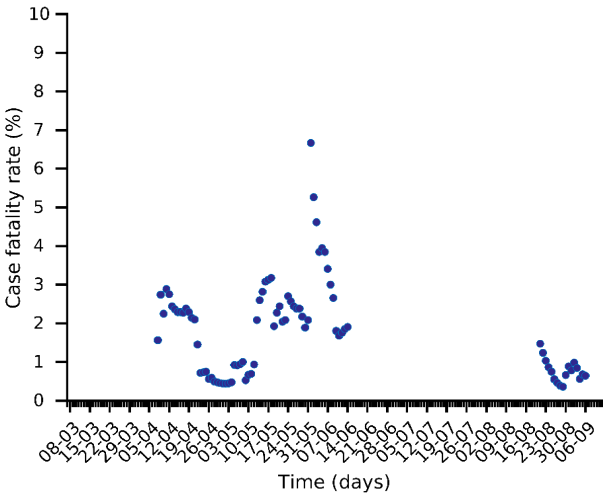
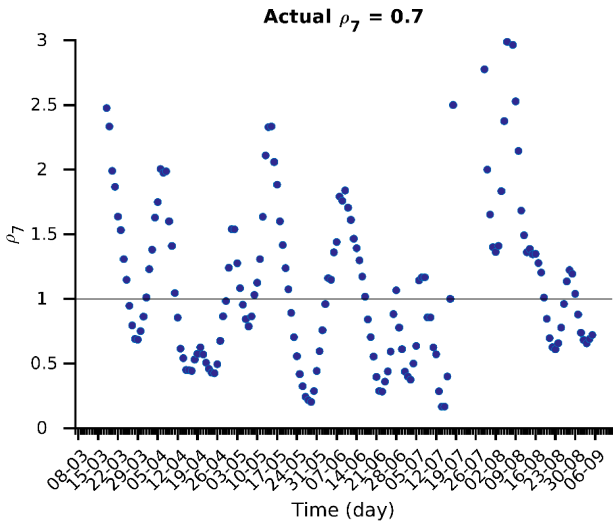
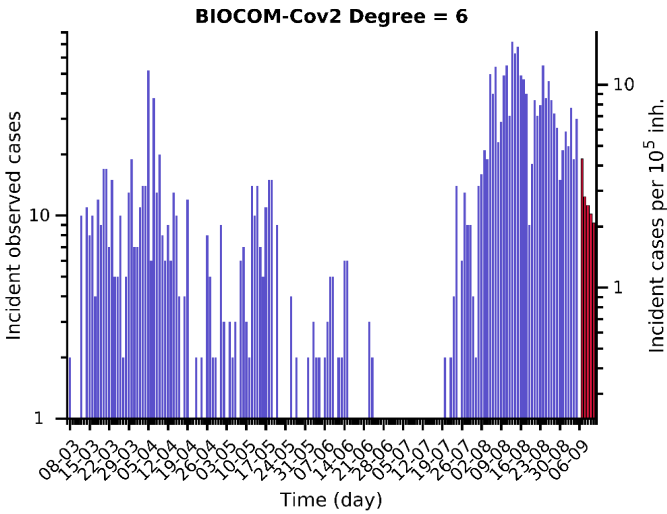
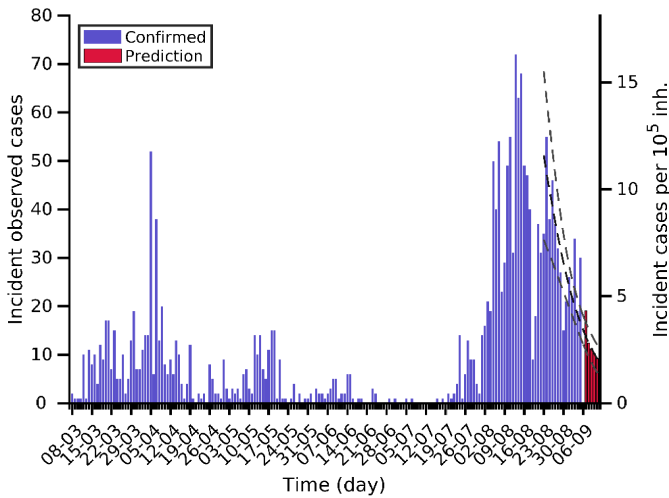


Malta 06-09-2020. Pop: 0.4M. Cumulative incidence: 456/10⁵

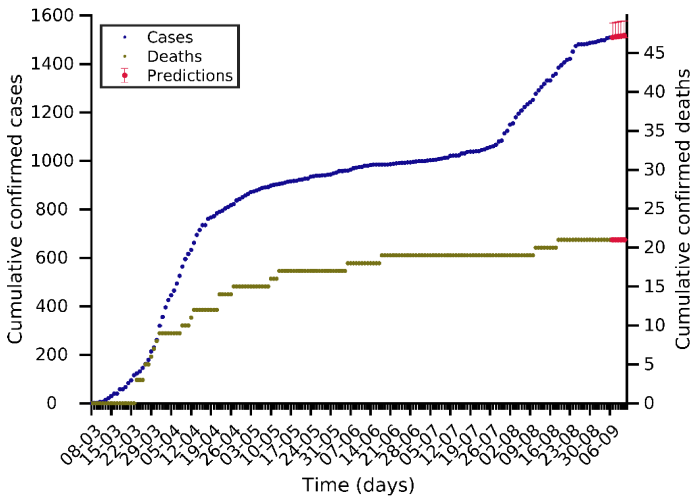


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	2033 (+19)	[2014 - 2137]
09-09-2020	2057 (+11)	[2014 - 2162]
11-09-2020	2076 (+9)	[2014 - 2185]

Current indicators		
A ₁₄	EPG	CFR
91	66	0.64 %

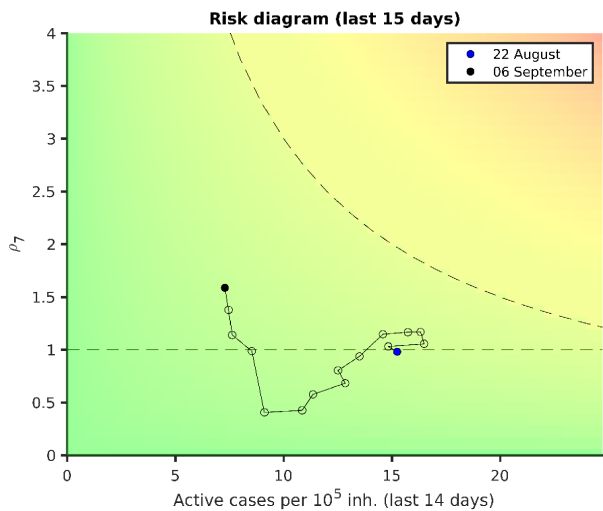
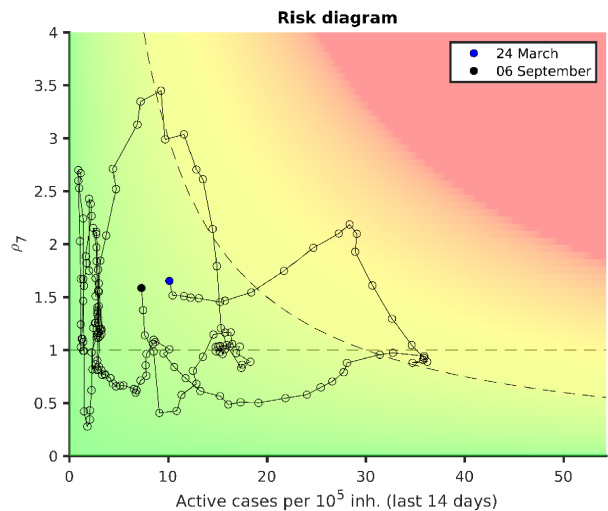
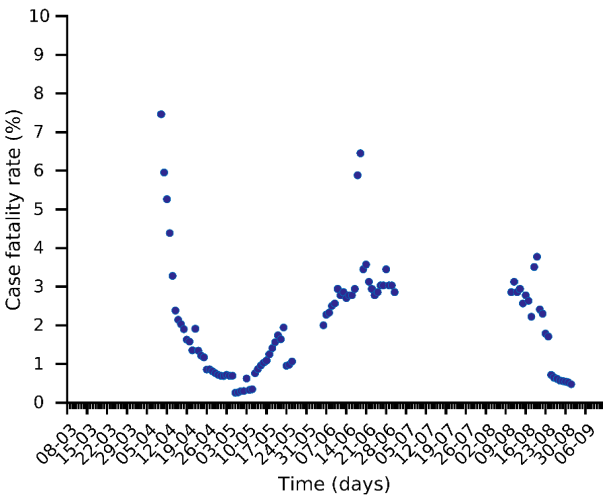
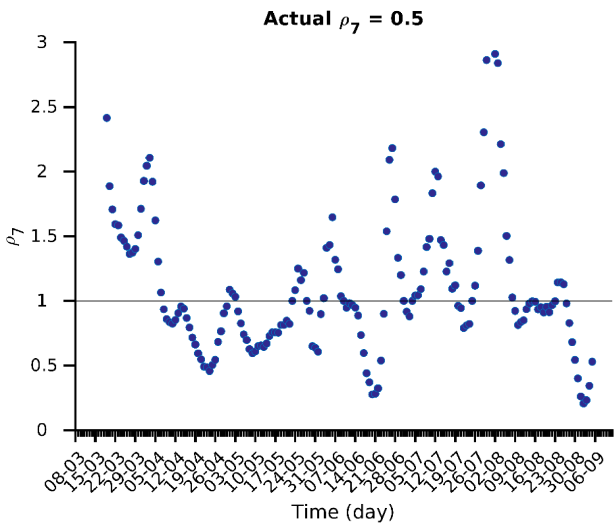
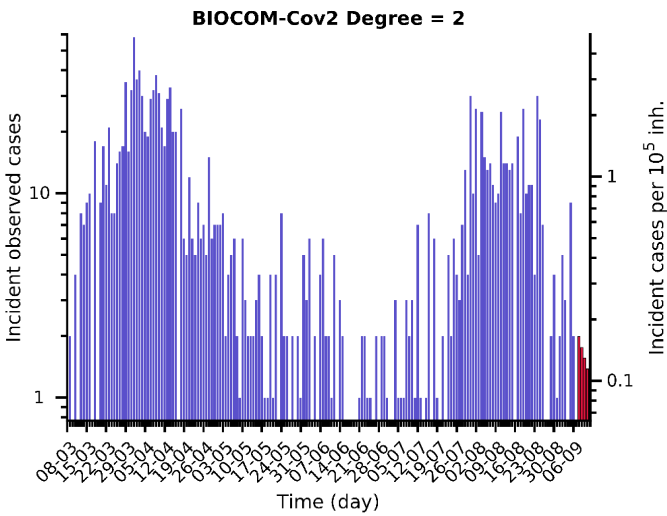
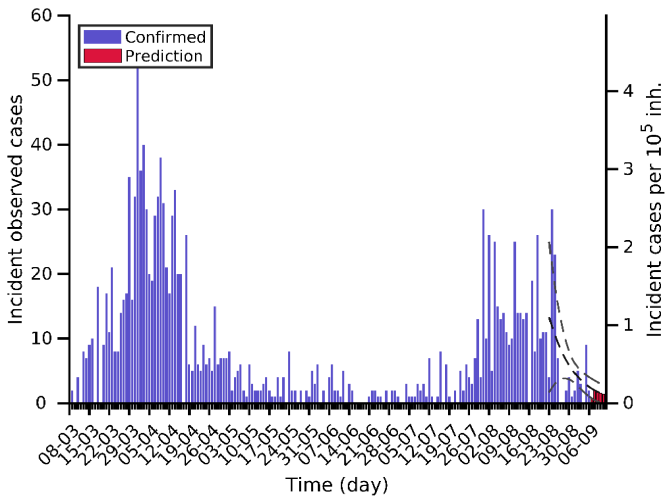


Cyprus 06-09-2020. Pop: 1.2M. Cumulative incidence: 125/10⁵

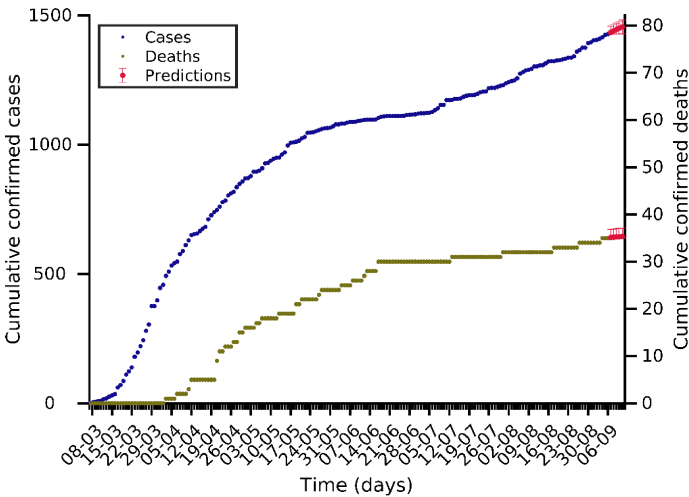


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	1510 (+1)	[1509 - 1569]
09-09-2020	1514 (+2)	[1509 - 1574]
11-09-2020	1516 (+1)	[1509 - 1578]

Current indicators		
A ₁₄	EPG	CFR
7	4	0.00 %

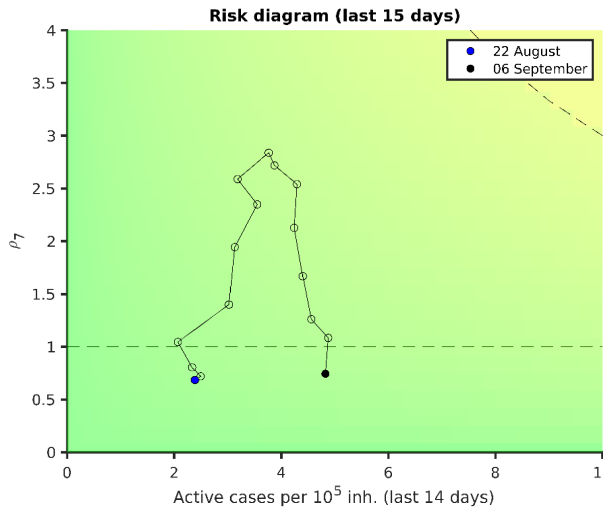
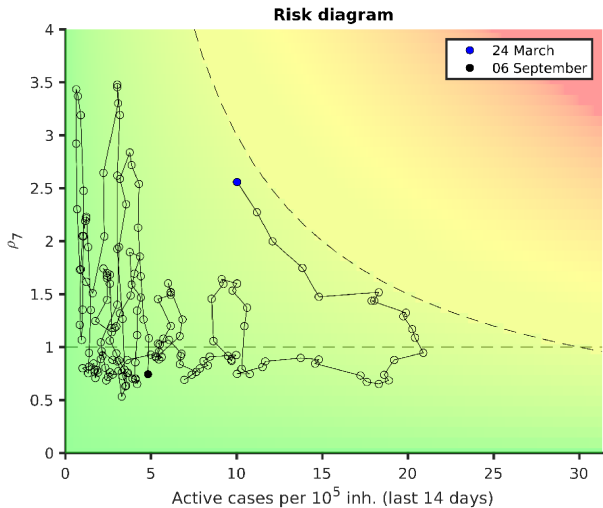
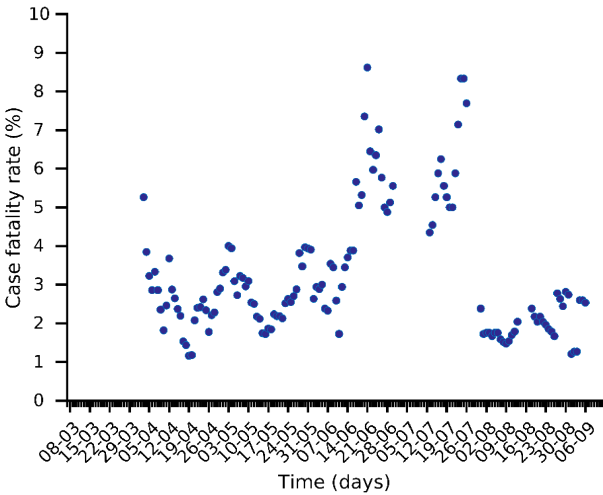
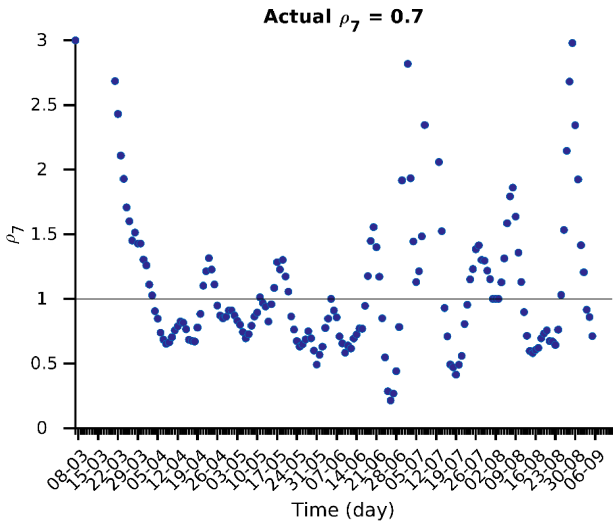
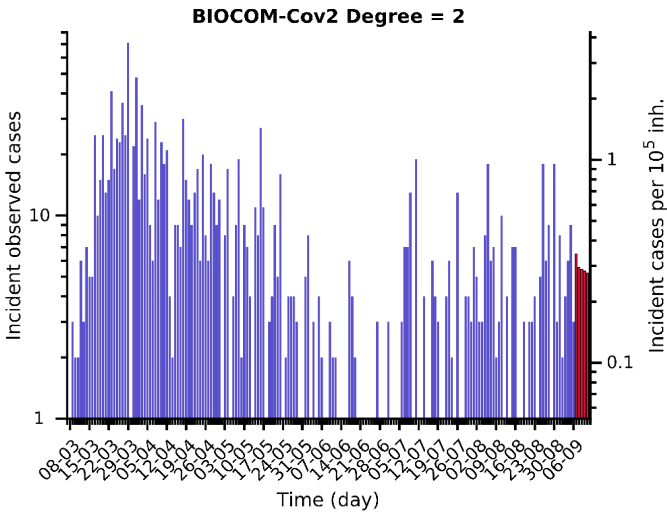
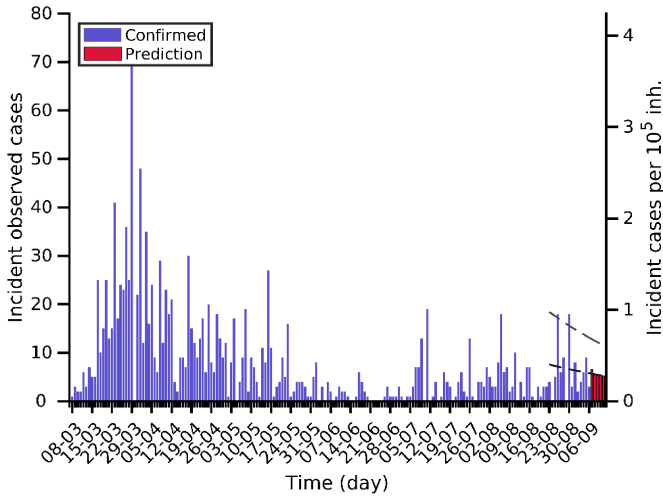


Latvia 06-09-2020. Pop: 1.9M. Cumulative incidence: 76/10⁵



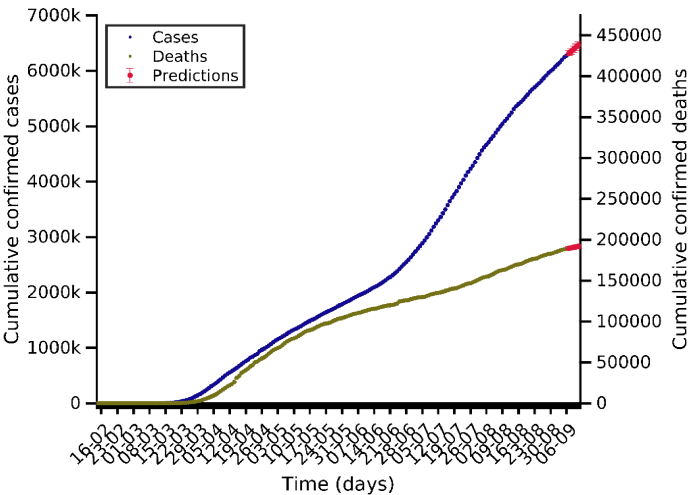
Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	1434 (+6)	[1428 - 1459]
09-09-2020	1445 (+5)	[1428 - 1471]
11-09-2020	1456 (+5)	[1429 - 1483]

Current indicators		
A ₁₄	EPG	CFR
5	3	2.53 %



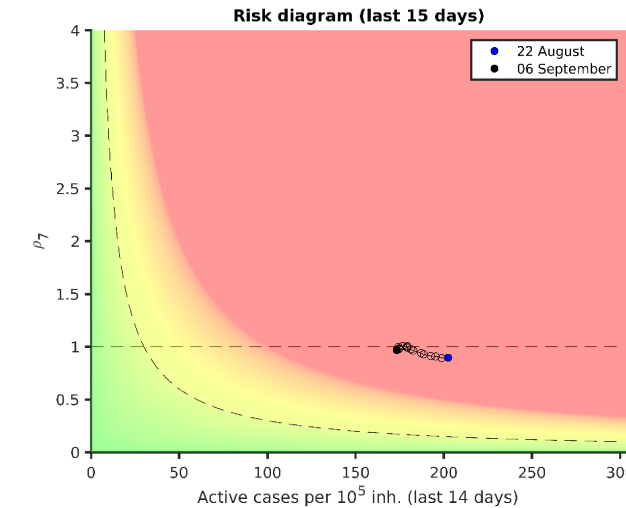
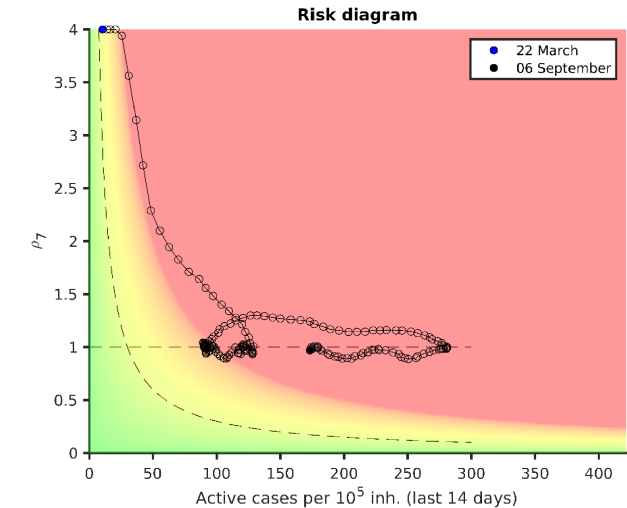
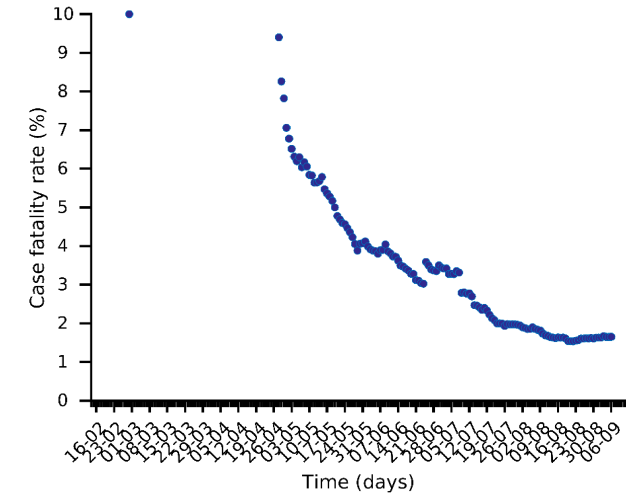
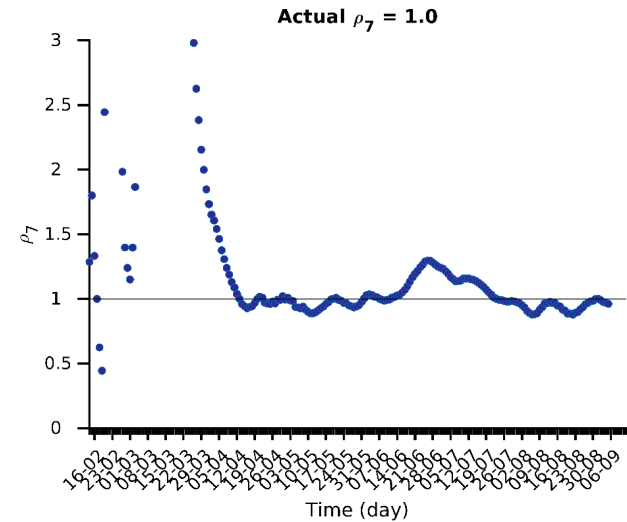
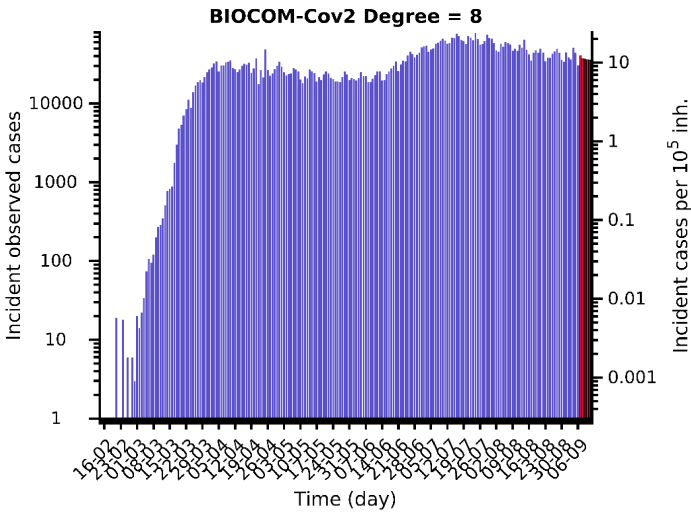
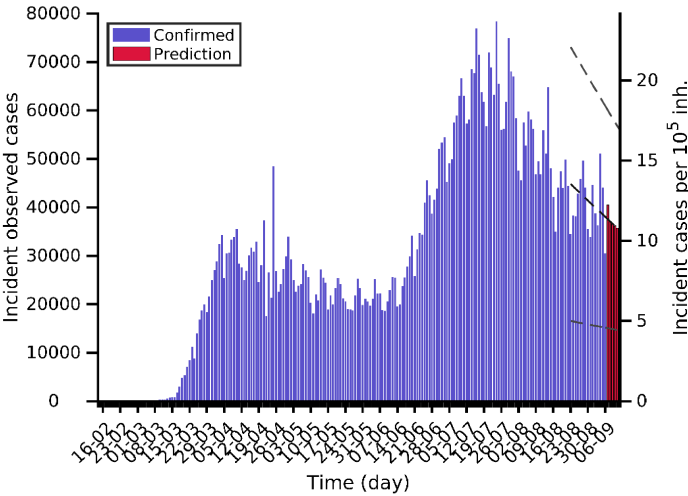
(2) Analysis and prediction of COVID-19 for other countries

USA 06-09-2020. Pop: 331.0M. Cumulative incidence: 1896/10⁵

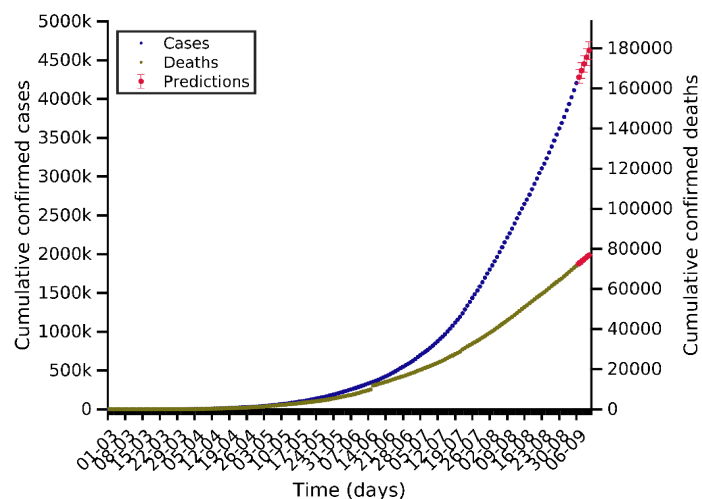


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	6316956 (+40535)	[6276421 - 6370450]
09-09-2020	6390713 (+36642)	[6335302 - 6446124]
11-09-2020	6462589 (+35704)	[6403232 - 6521947]

Current indicators		
A_{14}	EPG	CFR
173	167	1.65 %

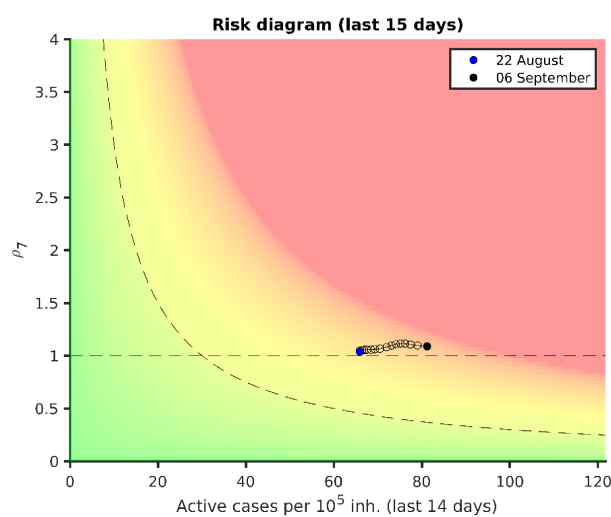
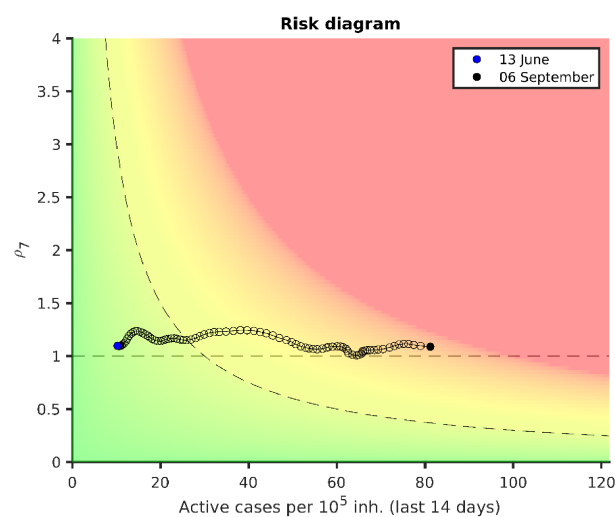
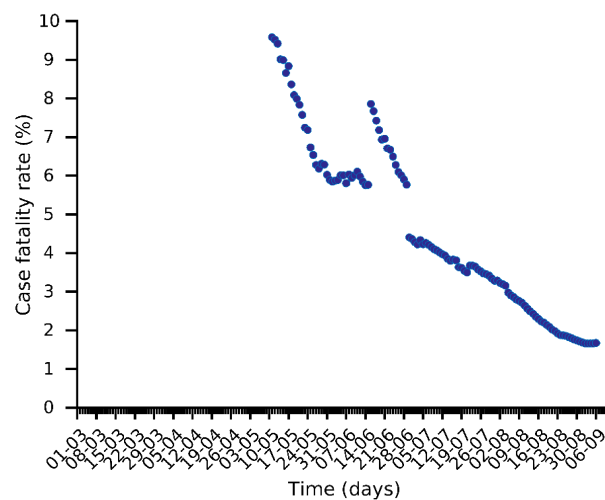
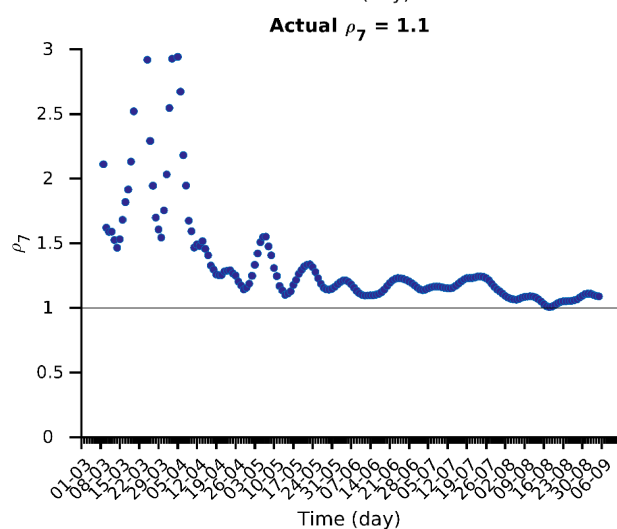
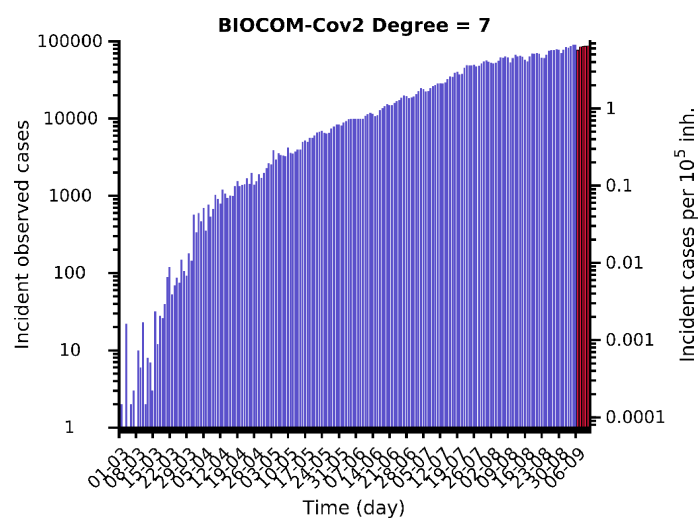
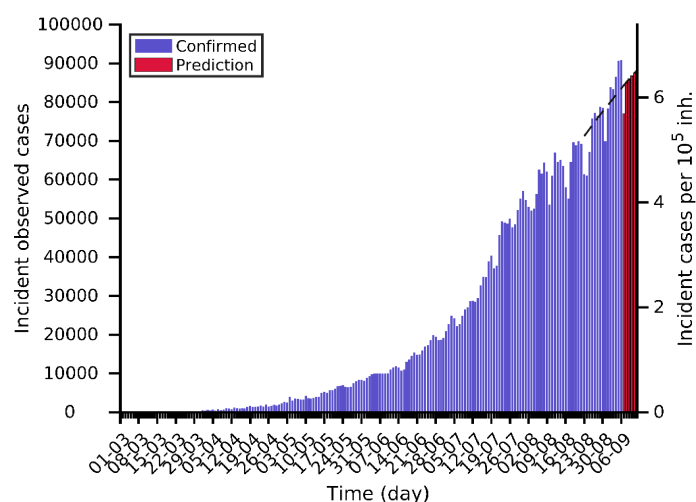


India 06-09-2020. Pop: 1353.0M. Cumulative incidence: 311/10⁵

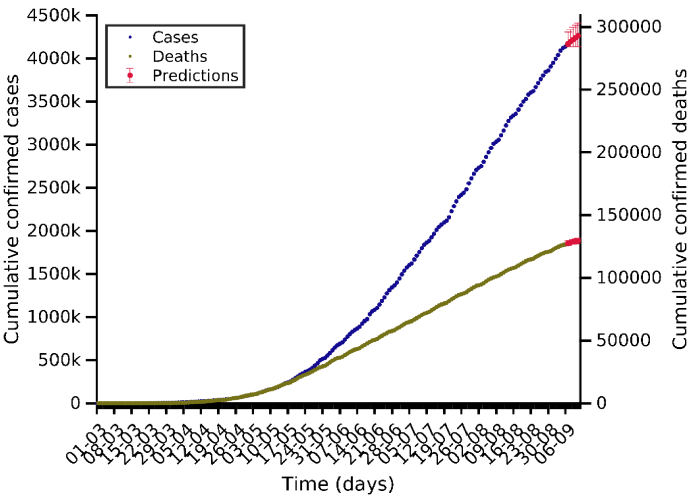


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	4281664 (+77051)	[4204613 - 4380877]
09-09-2020	4452782 (+85960)	[4349129 - 4556434]
11-09-2020	4627066 (+87533)	[4513449 - 4740684]

Current indicators		
A_{14}	EPG	CFR
81	88	1.67 %

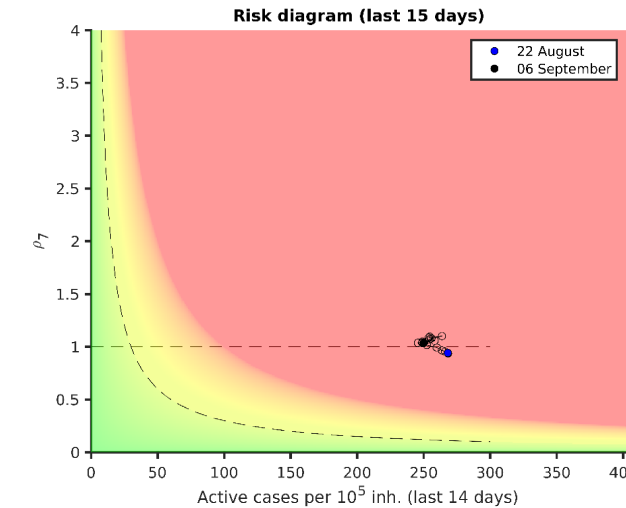
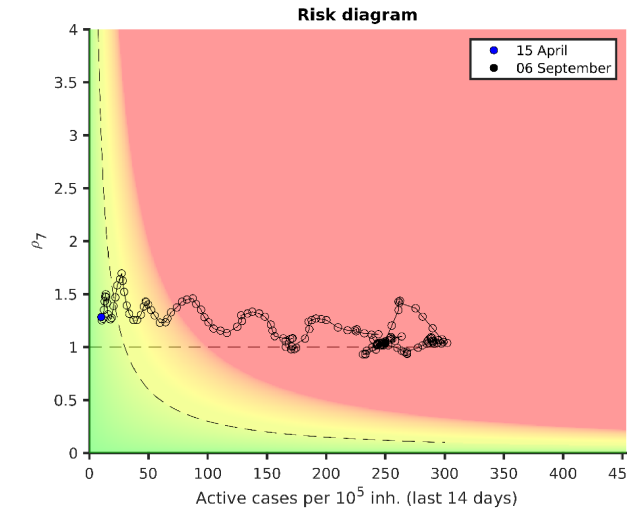
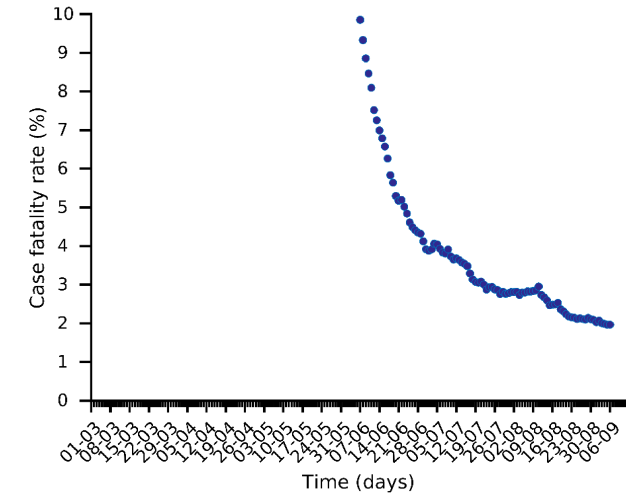
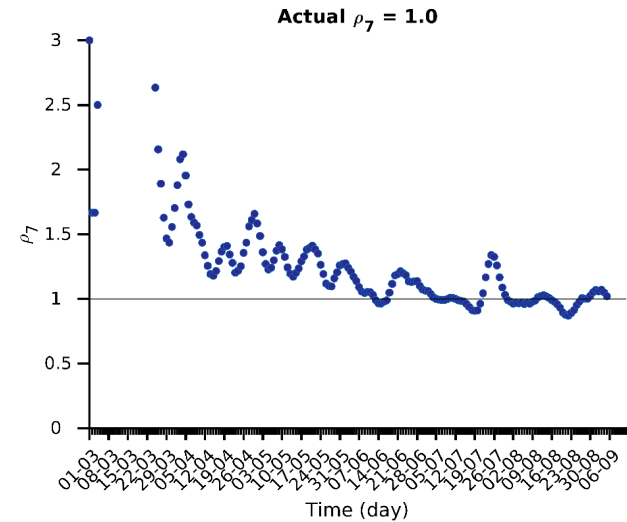
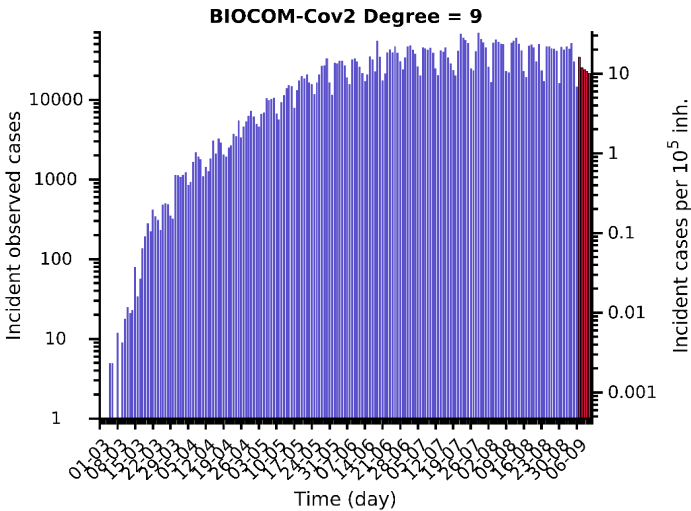
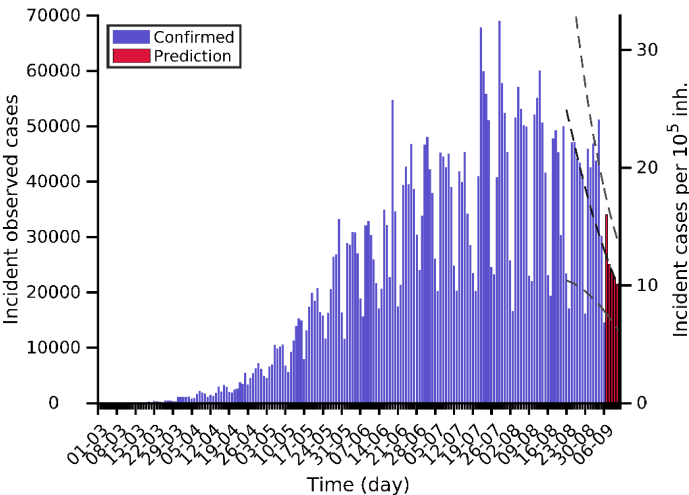


Brazil 06-09-2020. Pop: 212.6M. Cumulative incidence: 1947/10⁵

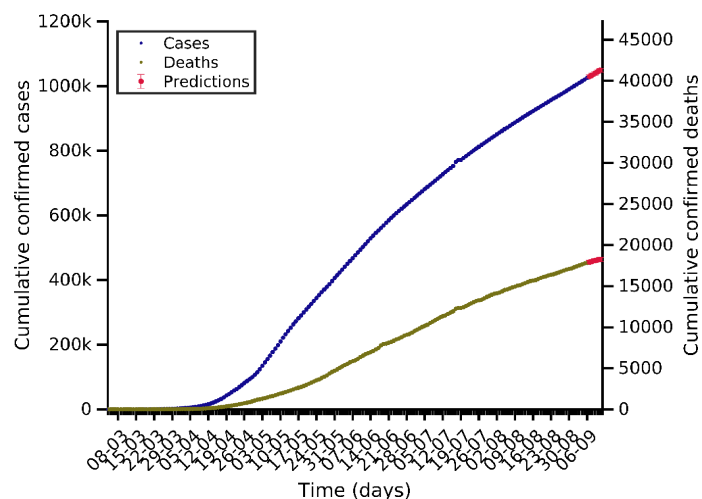


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	4171542 (+34021)	[4137521 - 4308837]
09-09-2020	4220541 (+23879)	[4137521 - 4361518]
11-09-2020	4264793 (+21559)	[4137521 - 4412506]

Current indicators		
A_{14}	EPG	CFR
250	255	1.96 %

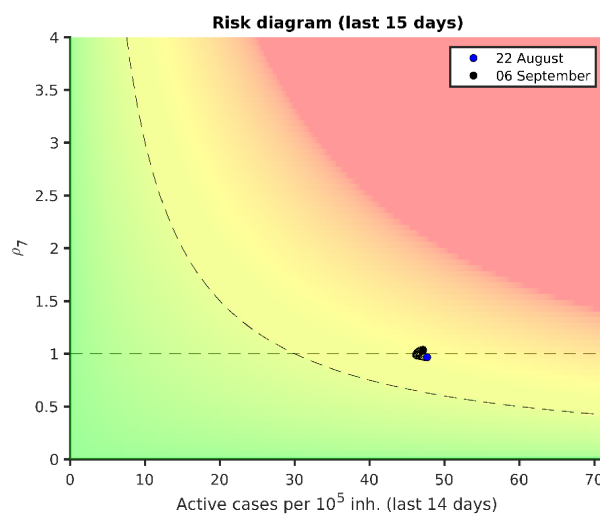
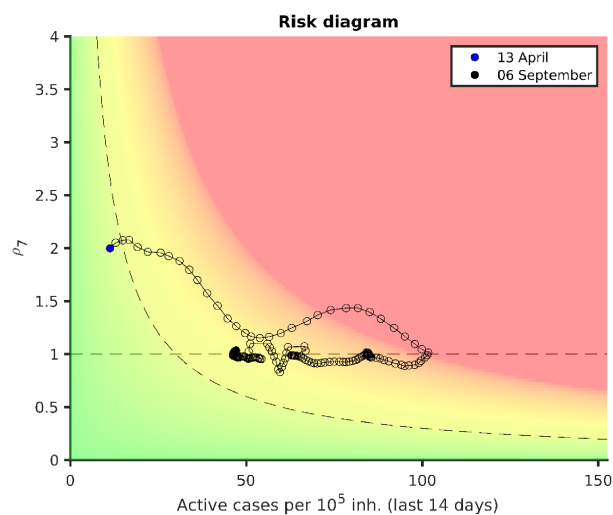
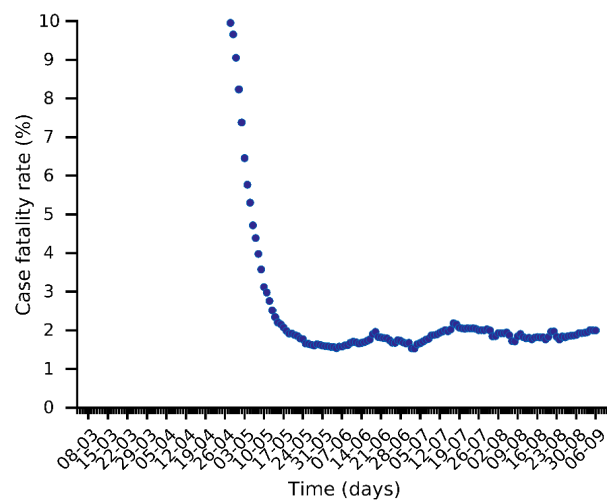
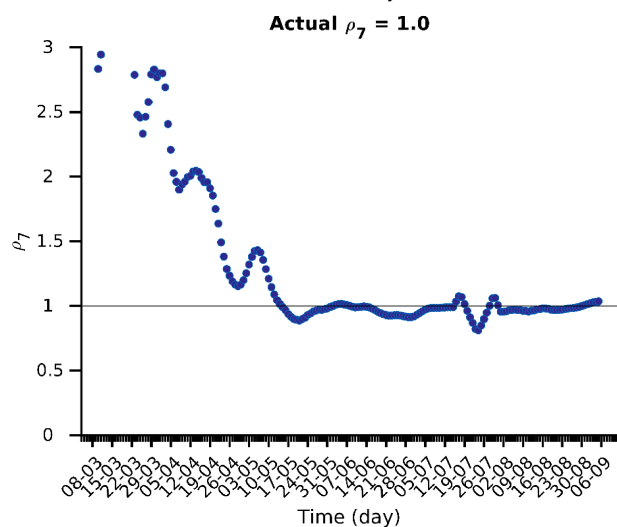
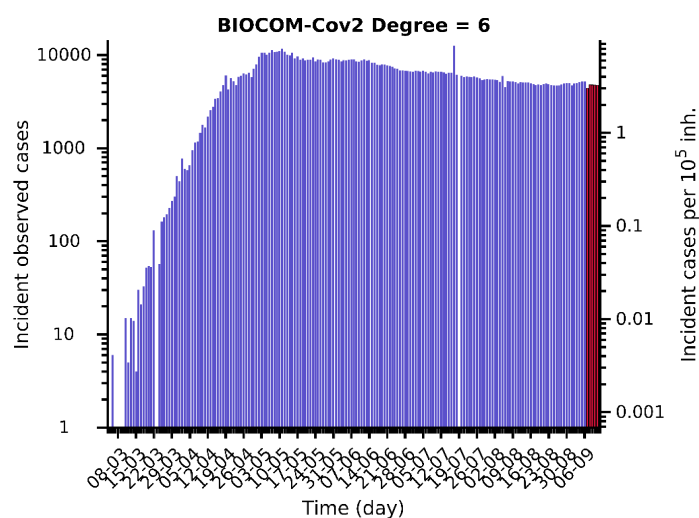
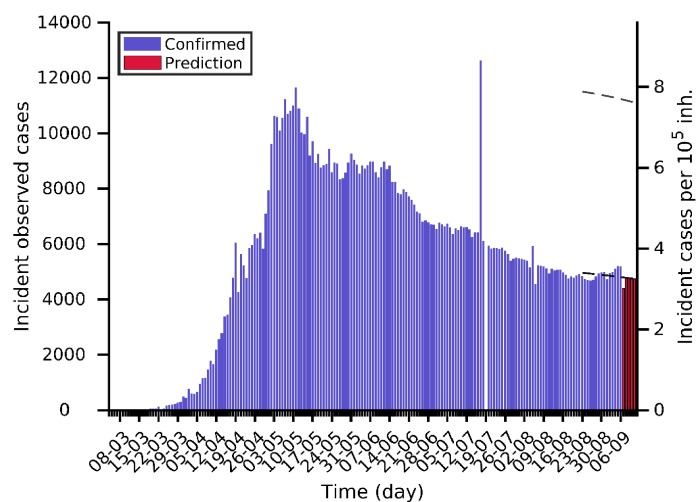


Russia 06-09-2020. Pop: 145.9M. Cumulative incidence: 703/10⁵

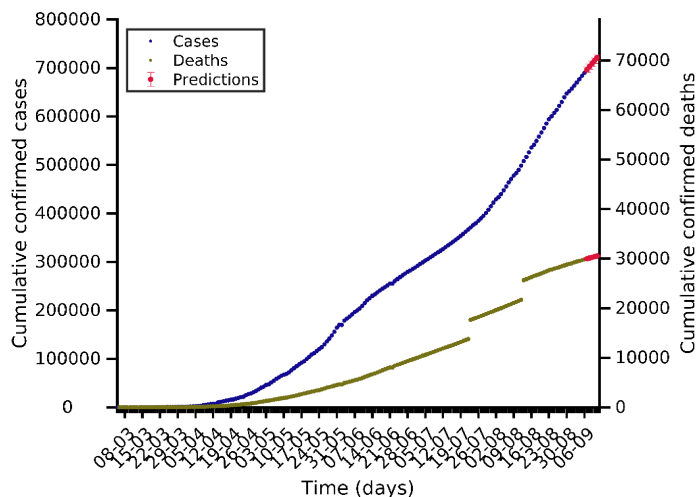


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	1029900 (+4395)	[1025505 - 1035036]
09-09-2020	1039450 (+4769)	[1034116 - 1044784]
11-09-2020	1048948 (+4743)	[1043195 - 1054701]

Current indicators		
A_{14}	EPG	CFR
47	49	2.00 %

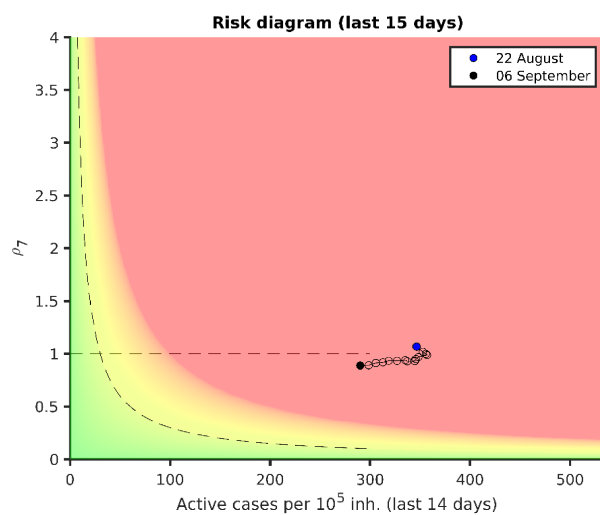
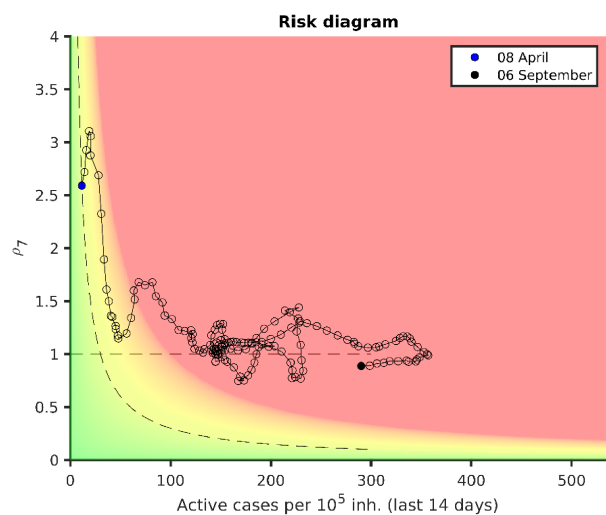
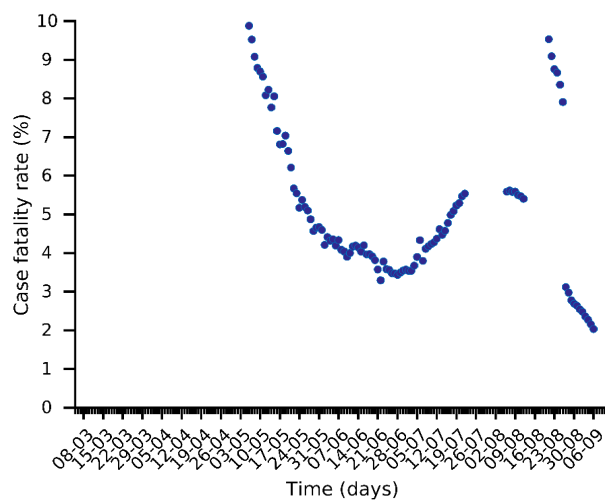
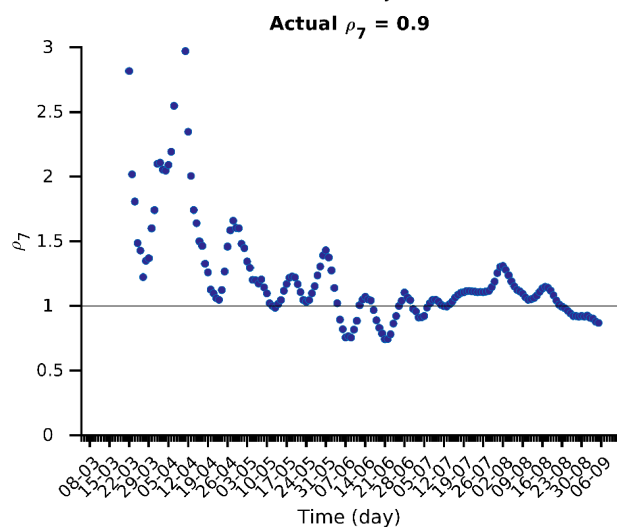
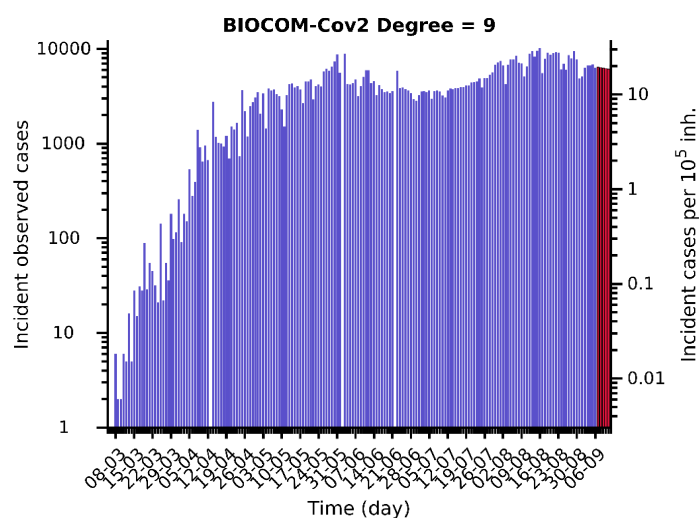
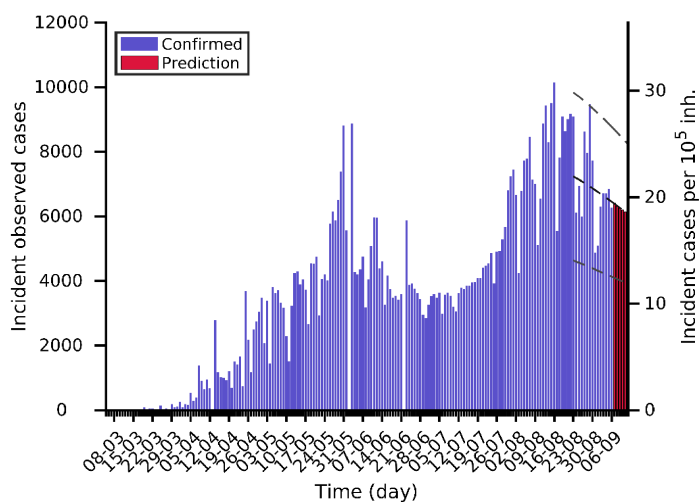


Peru 06-09-2020. Pop: 33.0M. Cumulative incidence: 2093/10⁵

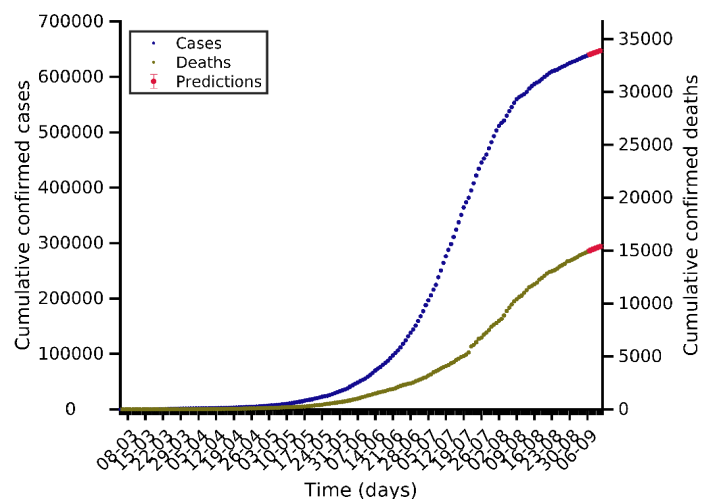


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	696389 (+6412)	[691149 - 701630]
09-09-2020	708987 (+6267)	[703551 - 714422]
11-09-2020	721330 (+6140)	[715489 - 727172]

Current indicators		
A_{14}	EPG	CFR
290	252	2.03 %

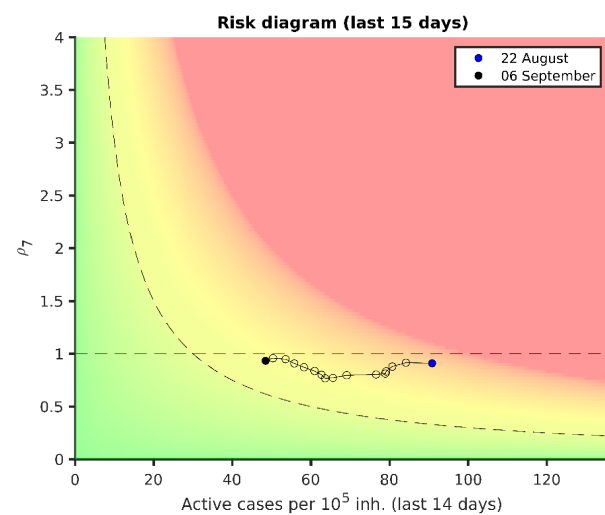
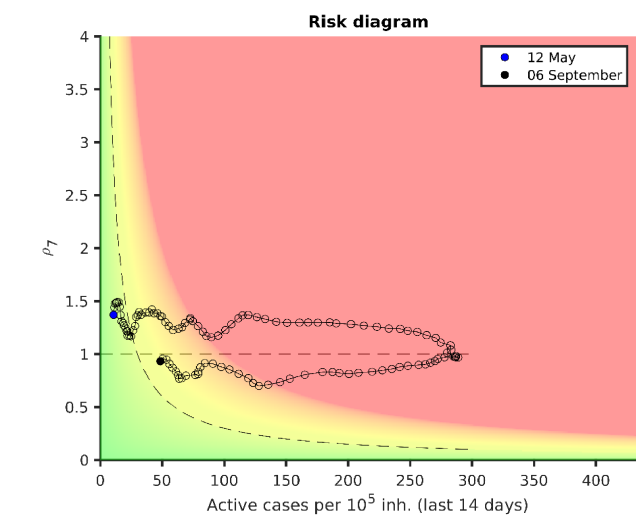
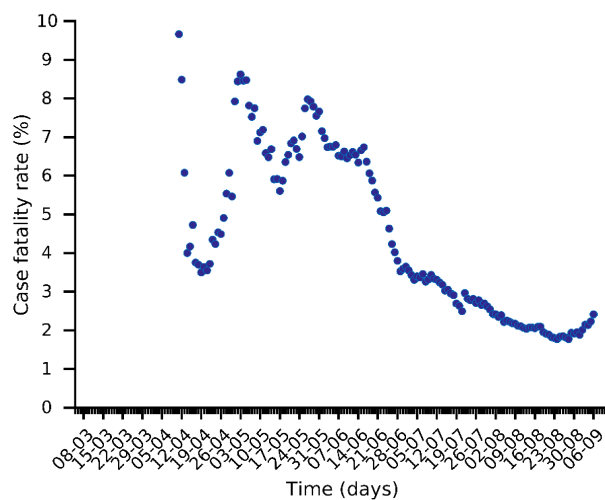
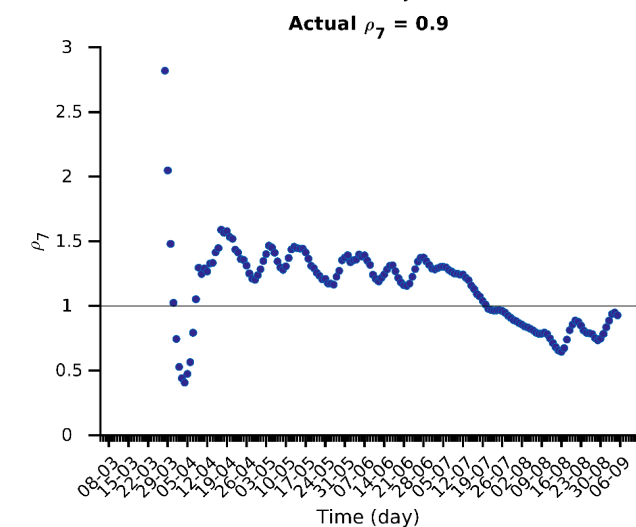
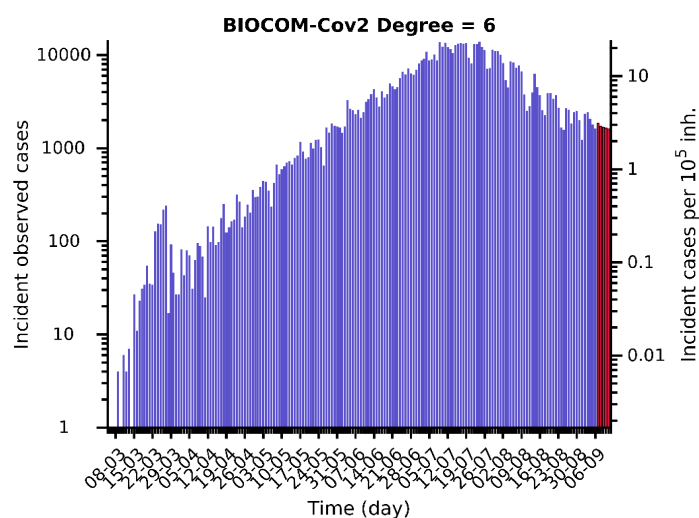
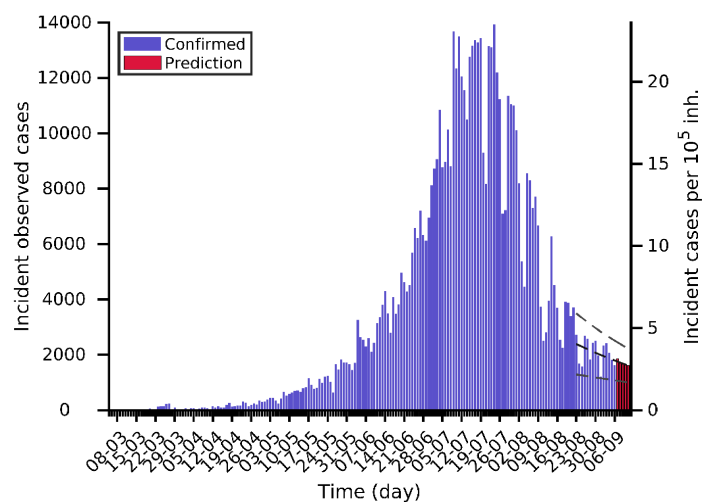


South Africa 06-09-2020. Pop: 59.3M. Cumulative incidence: 1077/10⁵

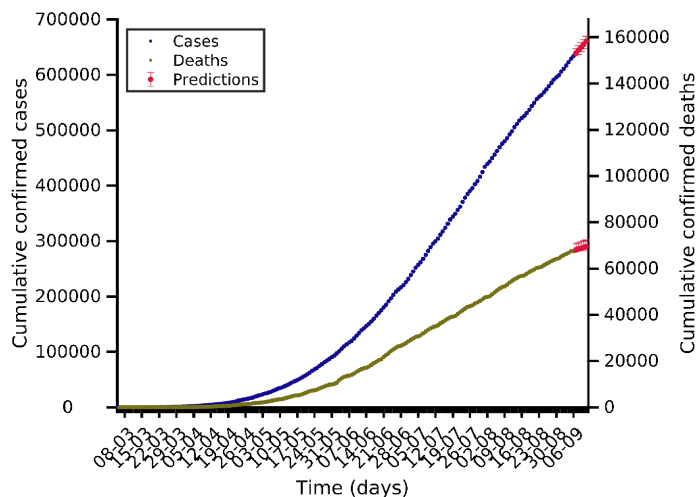


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	640377 (+1860)	[638517 - 642838]
09-09-2020	643782 (+1685)	[641240 - 646325]
11-09-2020	647046 (+1614)	[644341 - 649750]

Current indicators		
A_{14}	EPG	CFR
48	45	2.41 %

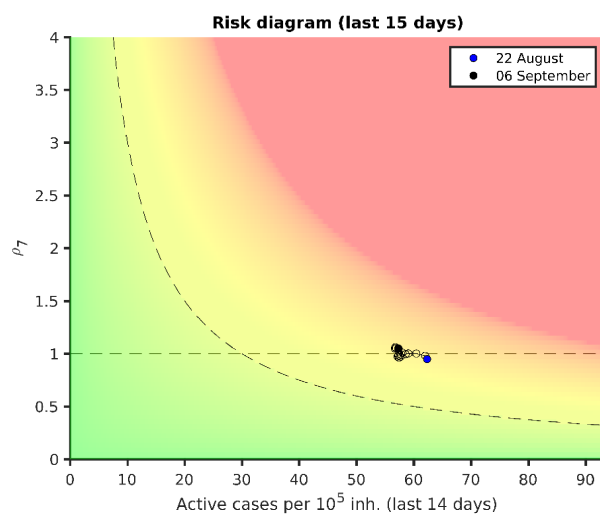
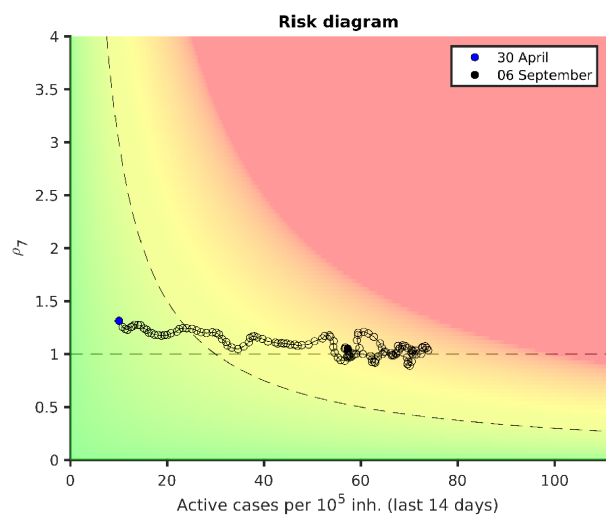
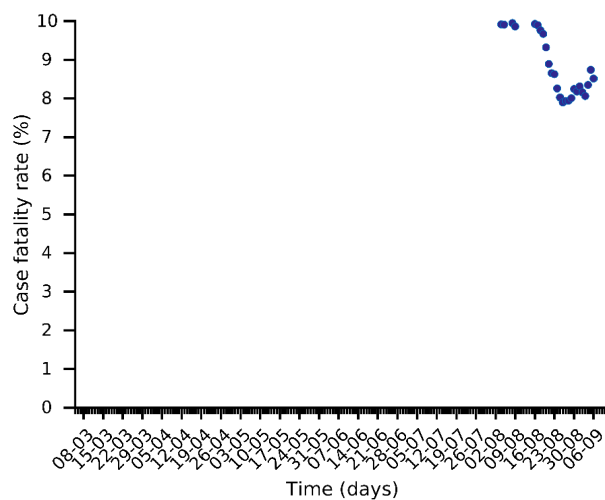
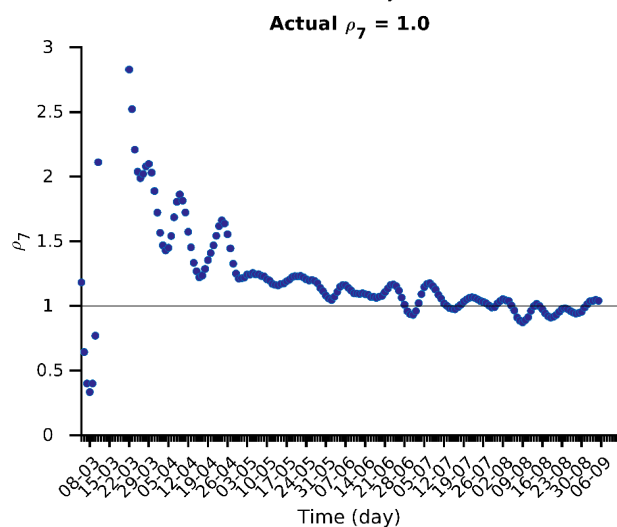
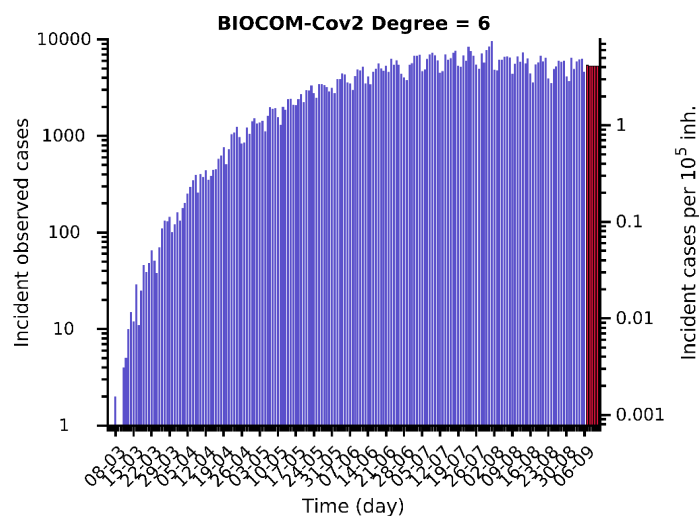
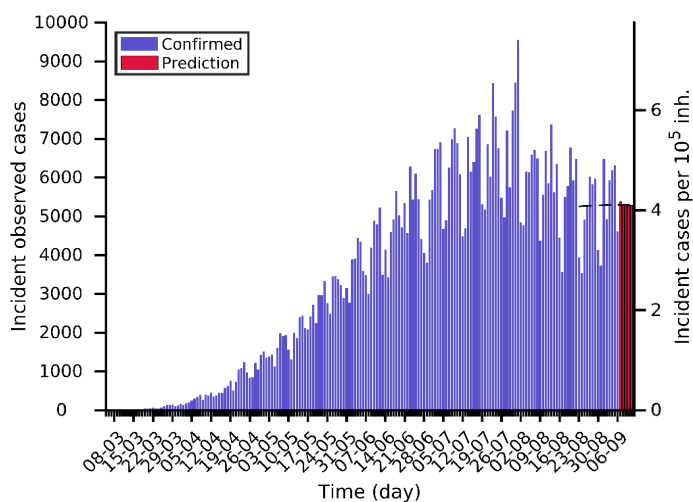


Mexico 06-09-2020. Pop: 128.9M. Cumulative incidence: 492/10⁵

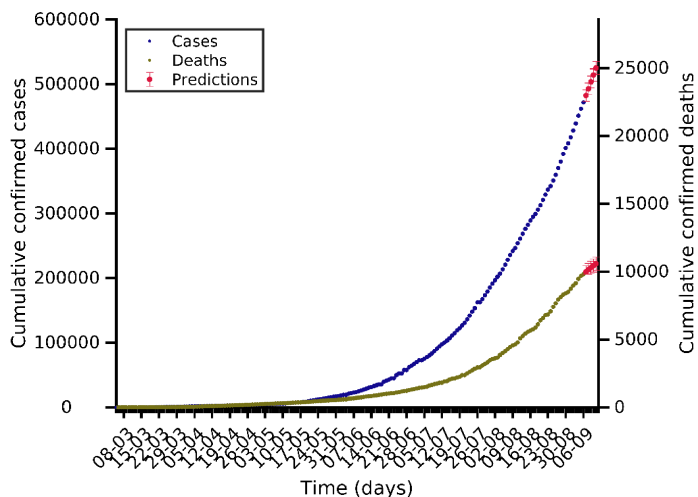


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	639405 (+5382)	[634023 - 647253]
09-09-2020	649989 (+5291)	[641829 - 658149]
11-09-2020	660568 (+5289)	[651737 - 669398]

Current indicators		
A_{14}	EPG	CFR
57	60	8.52 %



Argentina 06-09-2020. Pop: 45.2M. Cumulative incidence: 1044/10⁵

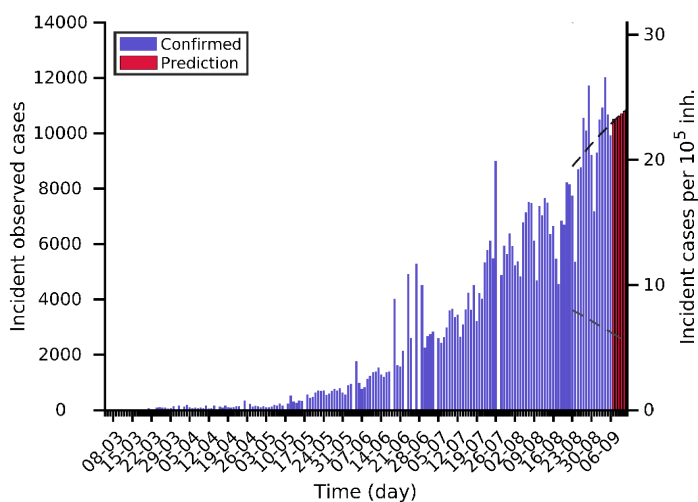


Predictions for next days

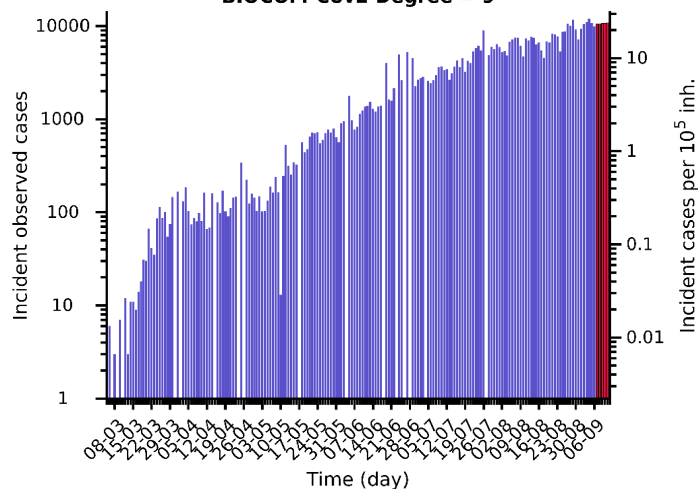
Day	Number of cases	95% Confidence Interval
07-09-2020	482308 (+10515)	[473566 - 491050]
09-09-2020	503447 (+10615)	[494312 - 512581]
11-09-2020	524944 (+10792)	[514927 - 534960]

Current indicators

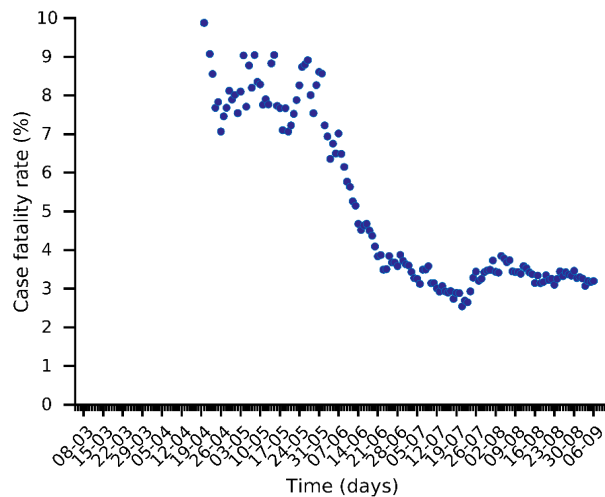
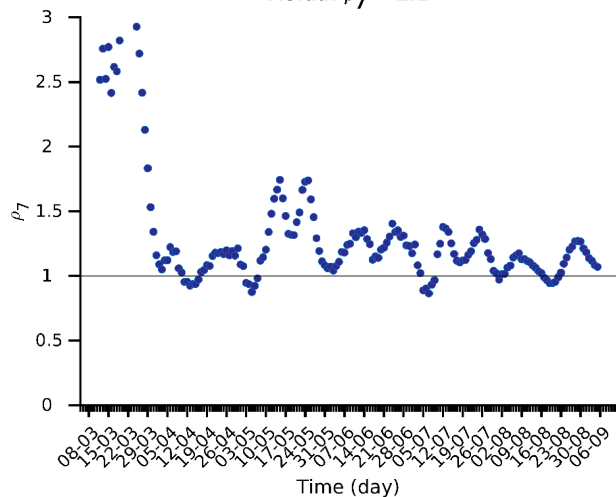
A ₁₄	EPG	CFR
299	320	3.20 %



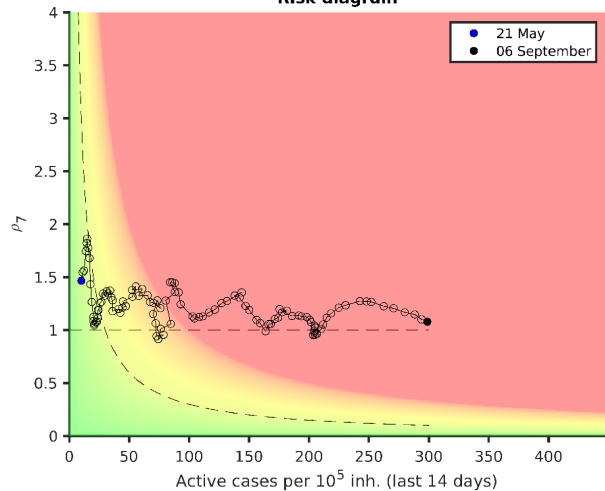
BIOCOM-Cov2 Degree = 9



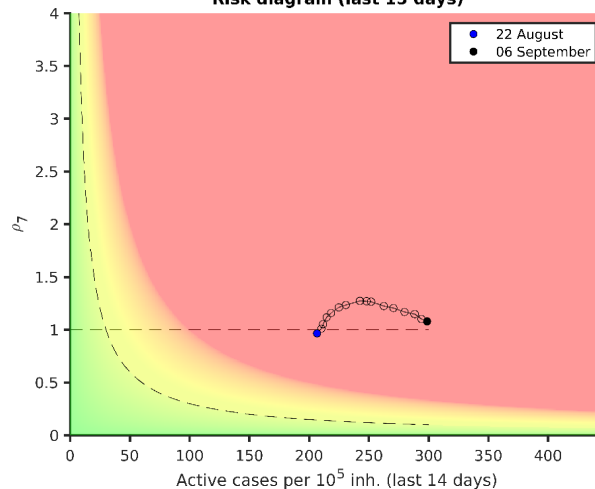
Actual $\rho_7 = 1.1$



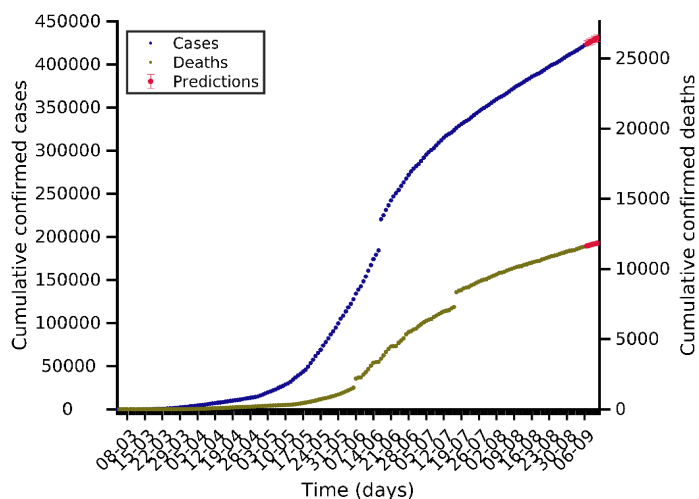
Risk diagram



Risk diagram (last 15 days)

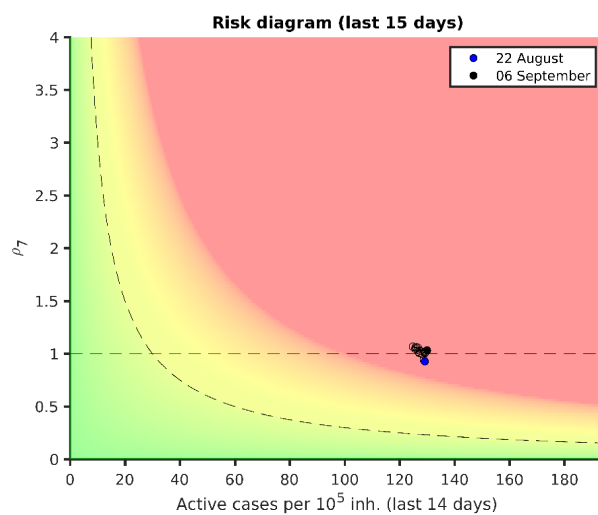
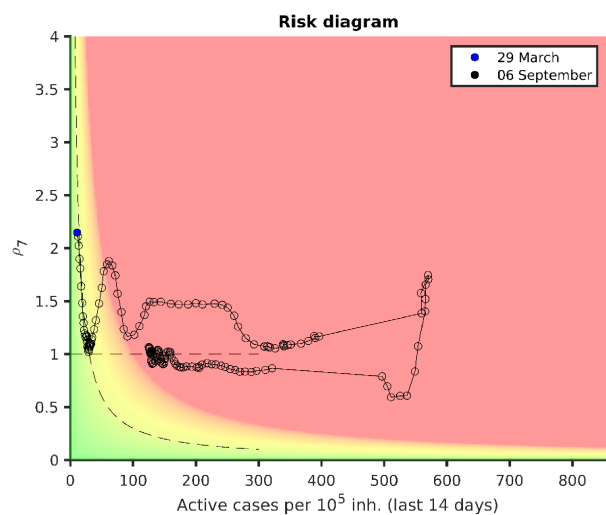
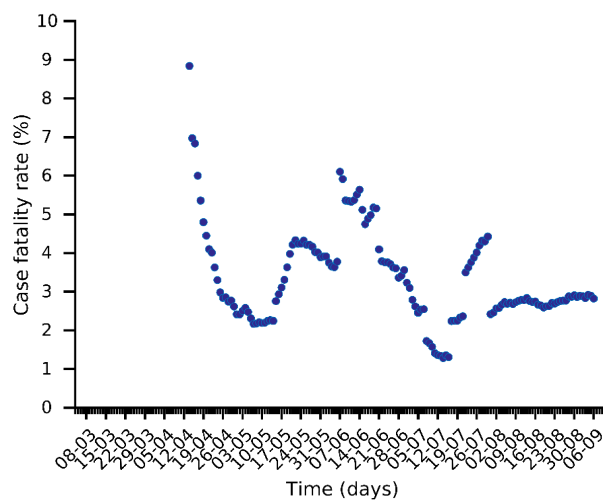
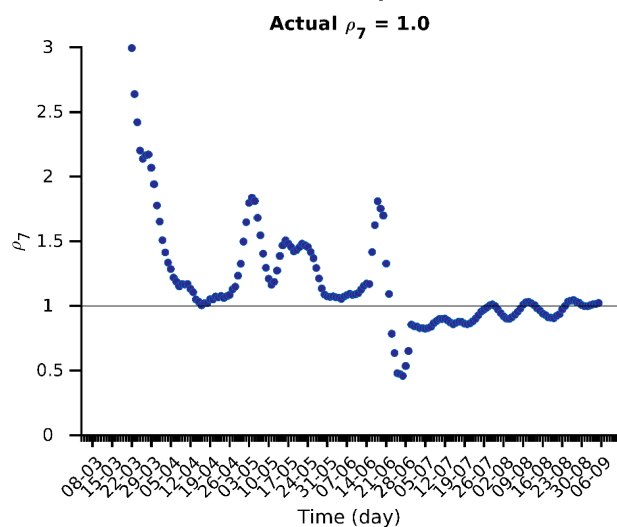
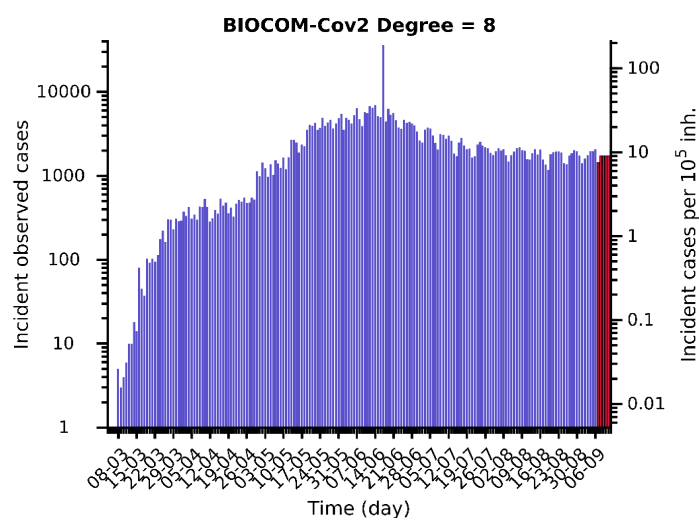
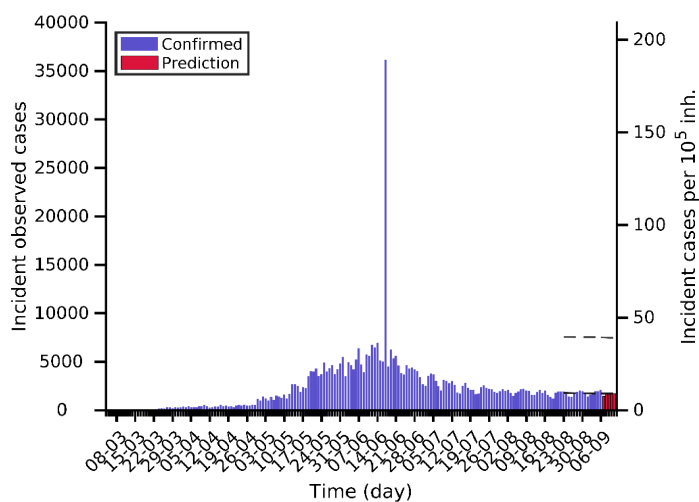


Chile 06-09-2020. Pop: 19.1M. Cumulative incidence: 2210/10⁵

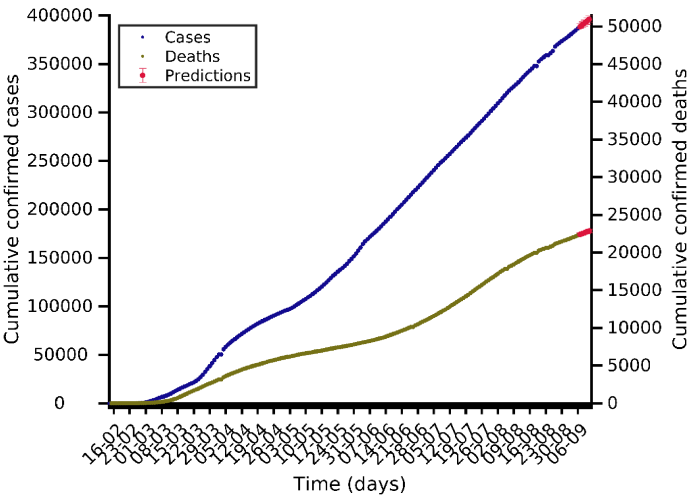


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	423947 (+1437)	[422510 - 427529]
09-09-2020	427406 (+1728)	[423685 - 431127]
11-09-2020	430853 (+1722)	[426837 - 434868]

Current indicators		
A_{14}	EPG	CFR
130	133	2.82 %

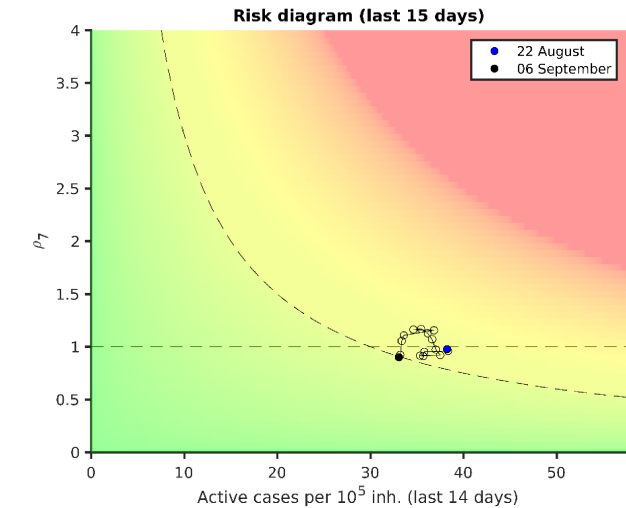
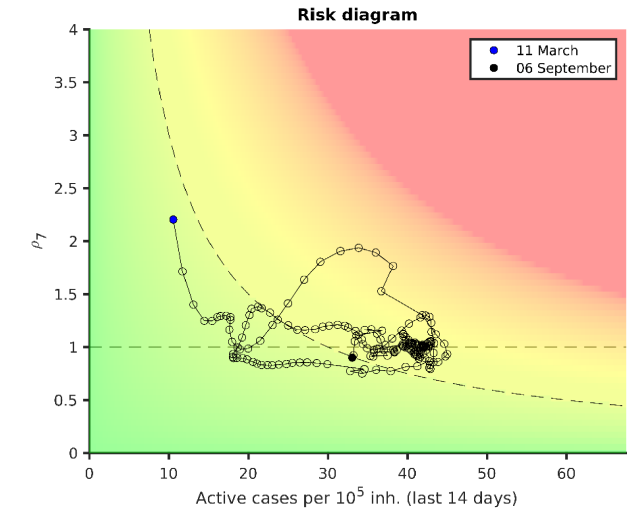
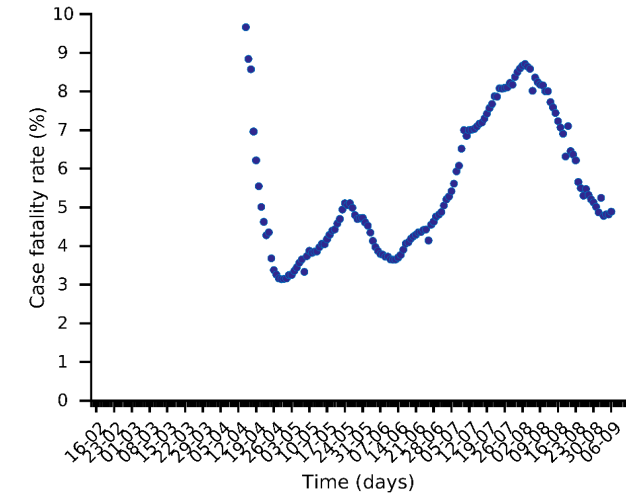
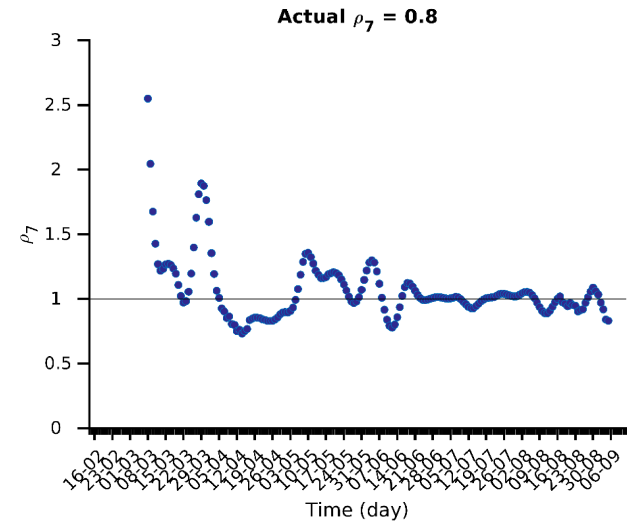
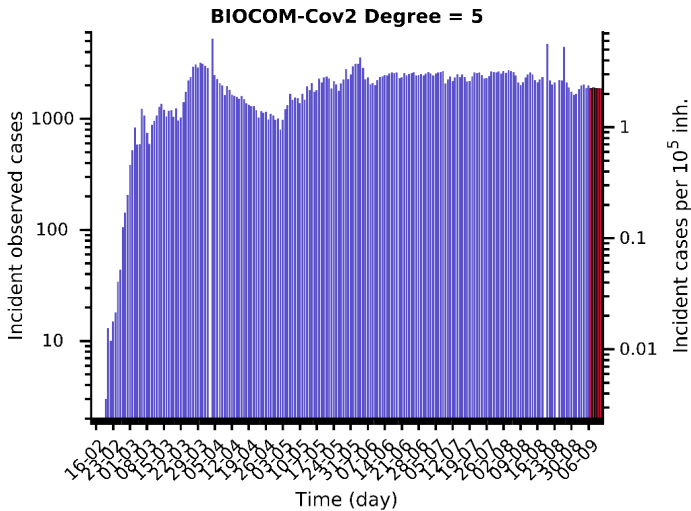
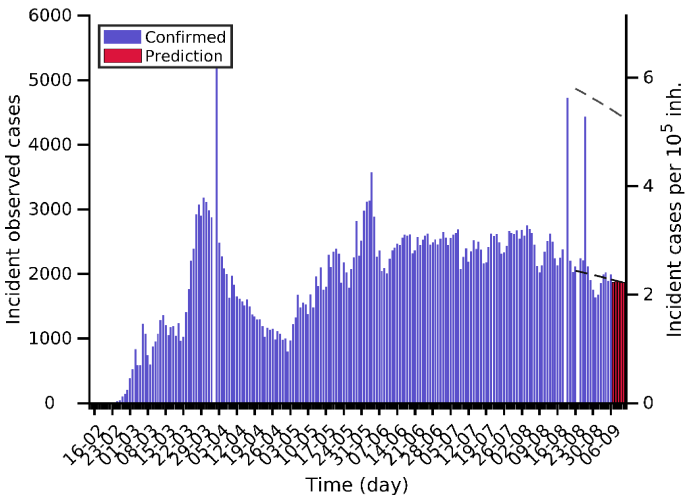


Iran 06-09-2020. Pop: 84.0M. Cumulative incidence: 460/10⁵

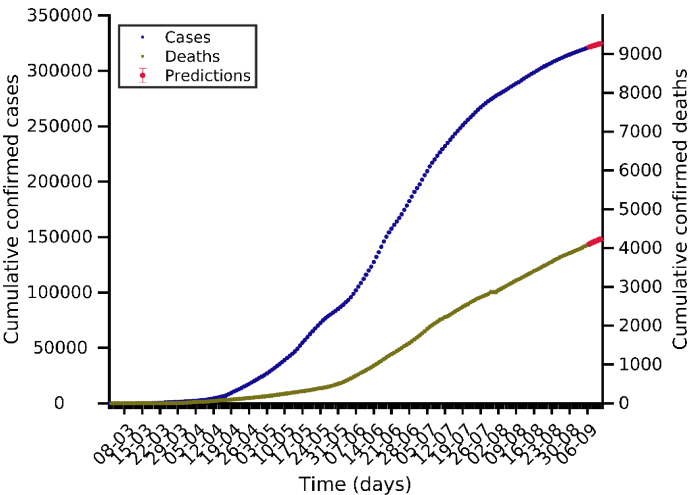


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	388527 (+1869)	[386658 - 391567]
09-09-2020	392310 (+1887)	[389155 - 395465]
11-09-2020	396053 (+1866)	[392656 - 399449]

Current indicators		
A ₁₄	EPG	CFR
33	27	4.89 %

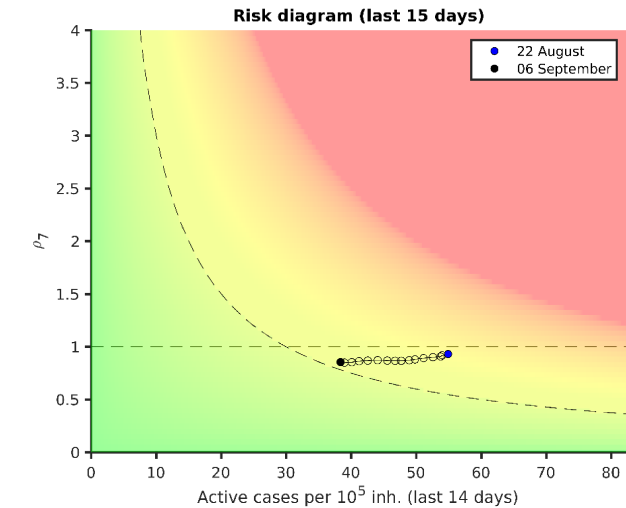
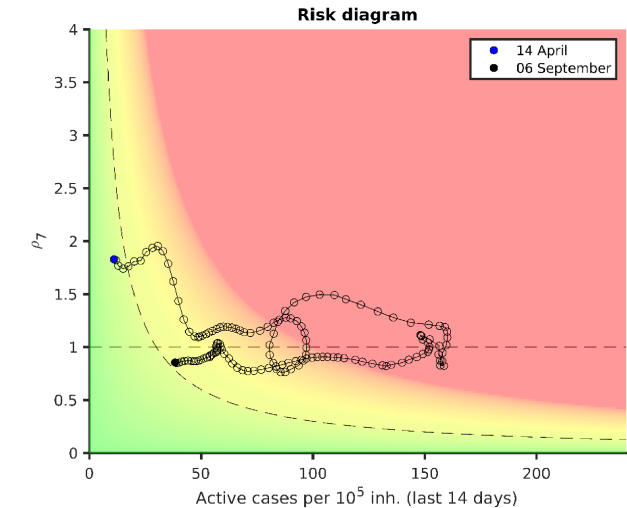
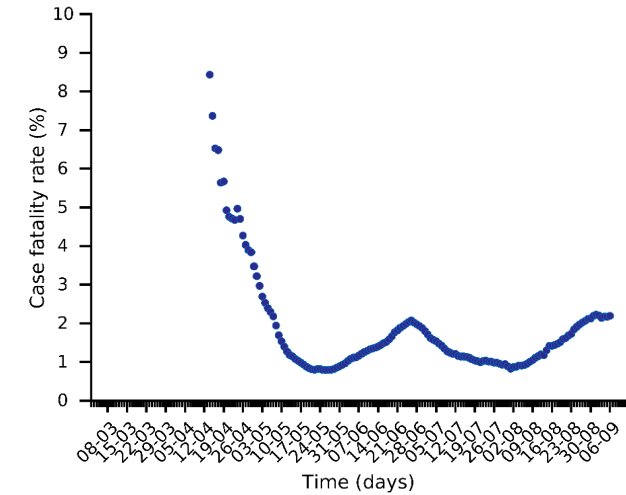
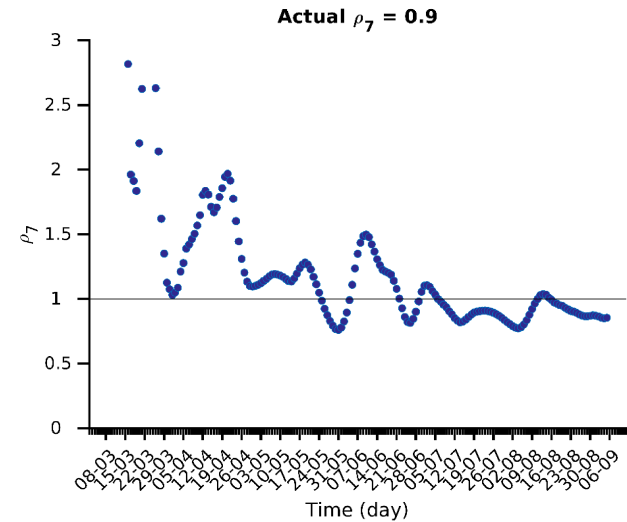
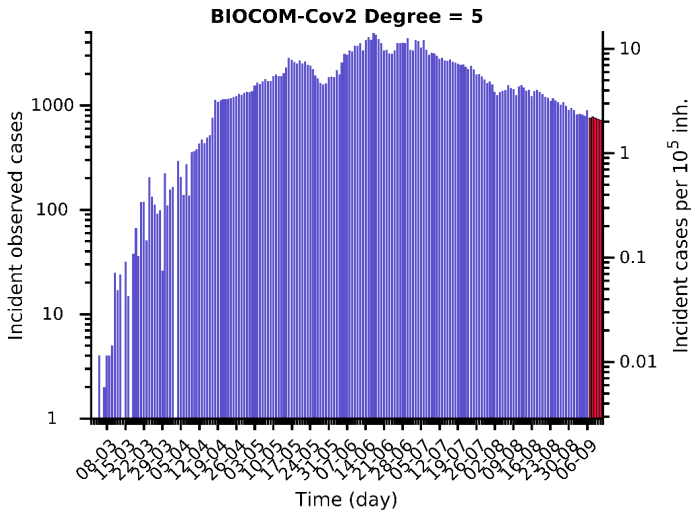
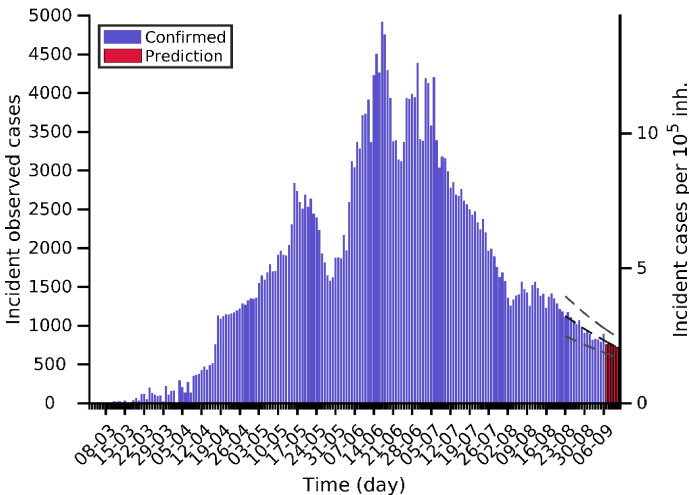


Saudi Arabia 06-09-2020. Pop: 34.8M. Cumulative incidence: 922/10⁵

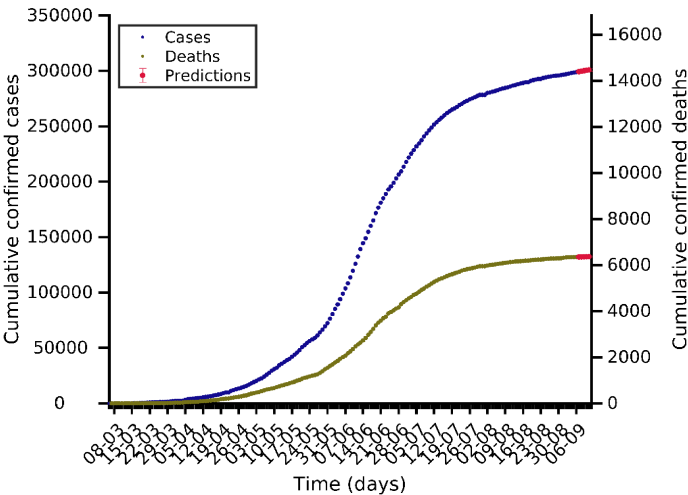


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	321585 (+758)	[320966 - 322203]
09-09-2020	323118 (+758)	[322479 - 323757]
11-09-2020	324581 (+722)	[323902 - 325259]

Current indicators		
A ₁₄	EPG	CFR
38	33	2.19 %

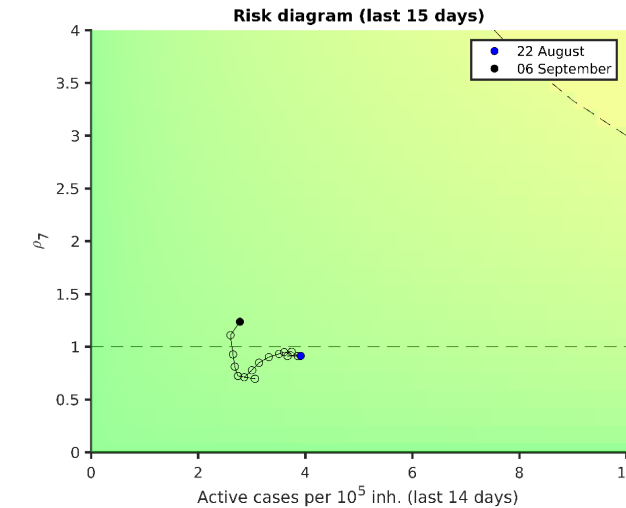
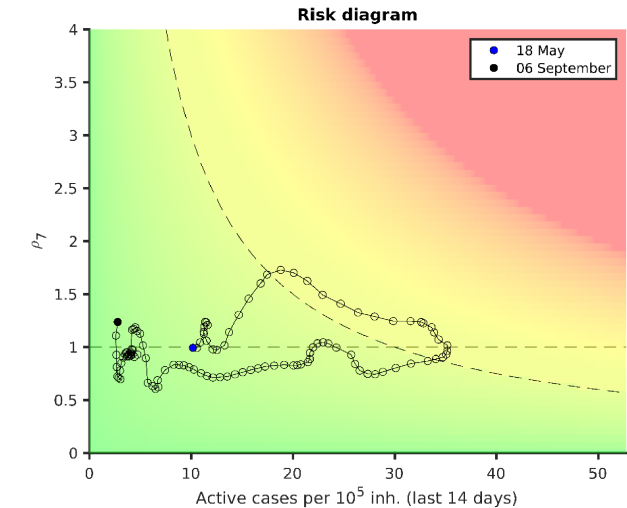
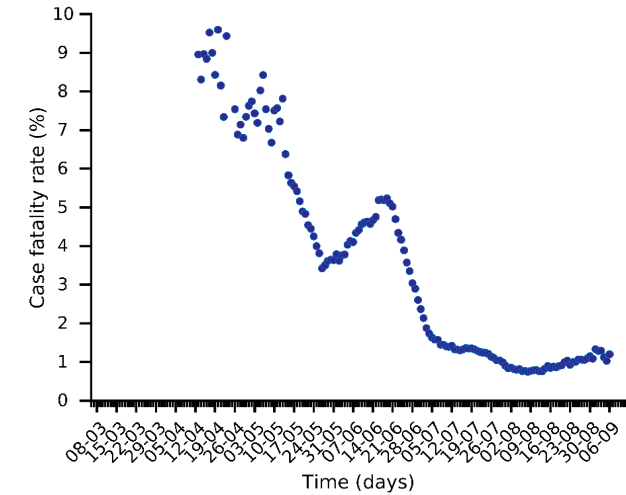
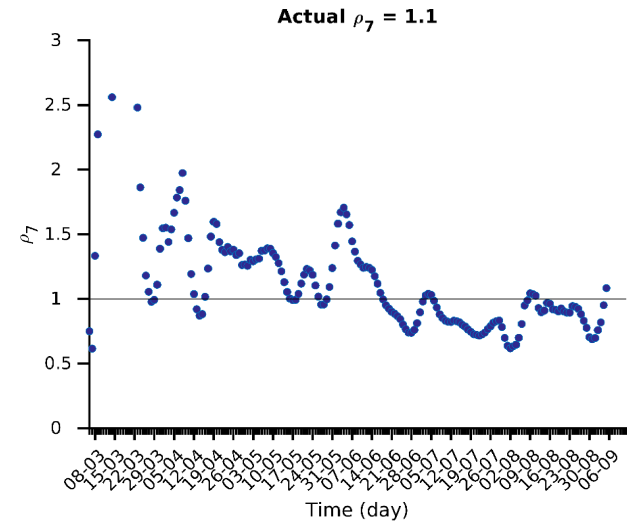
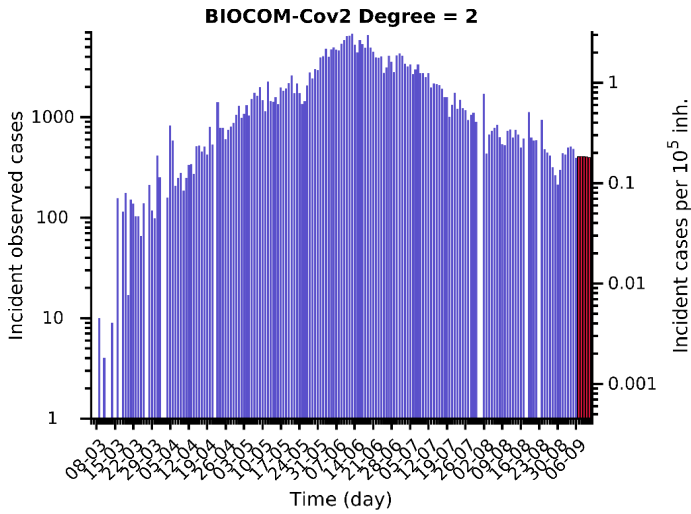
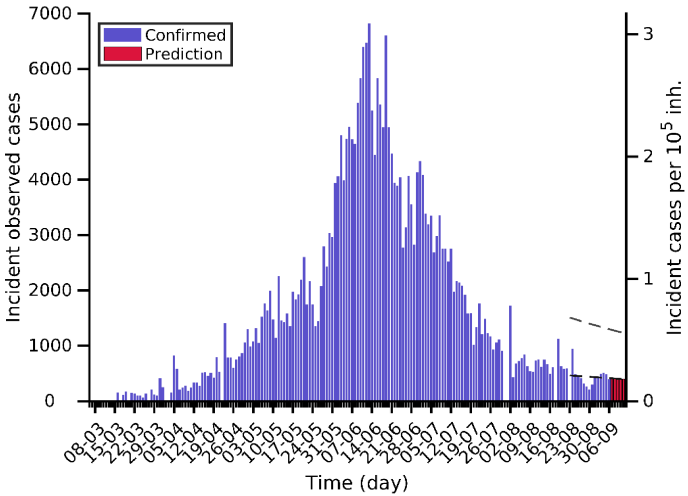


Pakistan 06-09-2020. Pop: 220.9M. Cumulative incidence: 135/10⁵

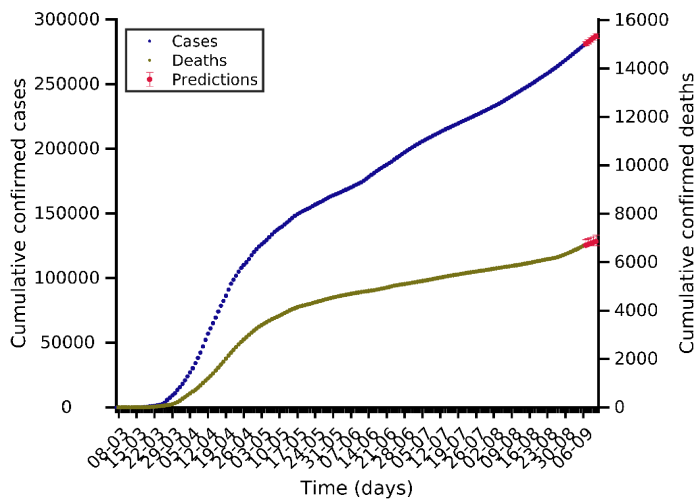


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	299308 (+405)	[298903 - 300330]
09-09-2020	300121 (+405)	[299061 - 301180]
11-09-2020	300920 (+398)	[299784 - 302056]

Current indicators		
A ₁₄	EPG	CFR
3	3	1.20 %

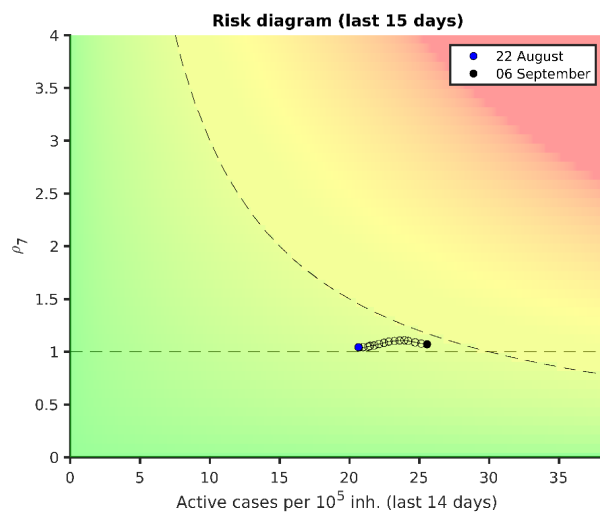
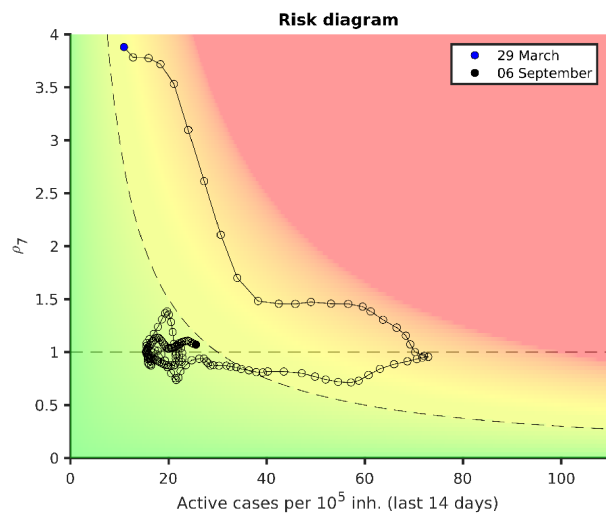
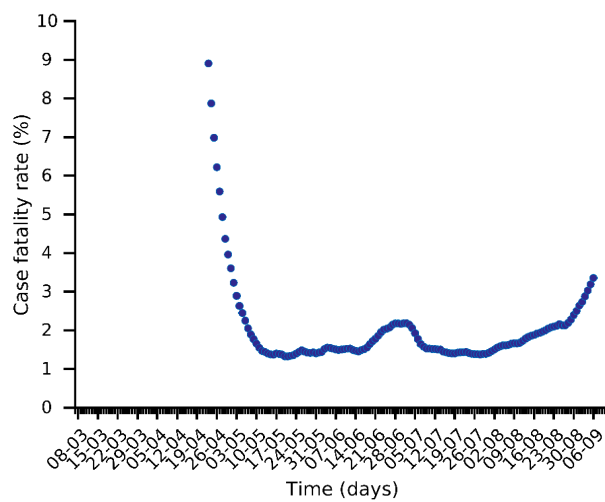
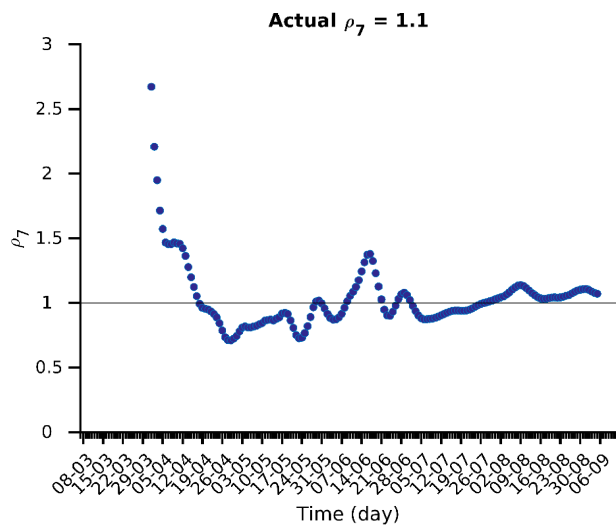
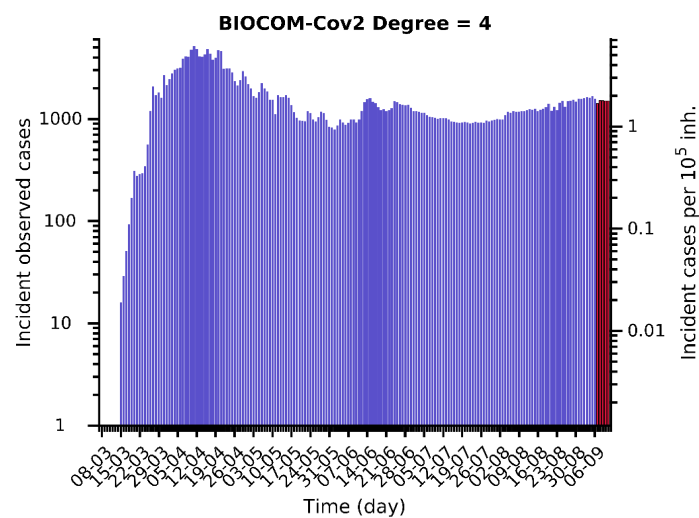
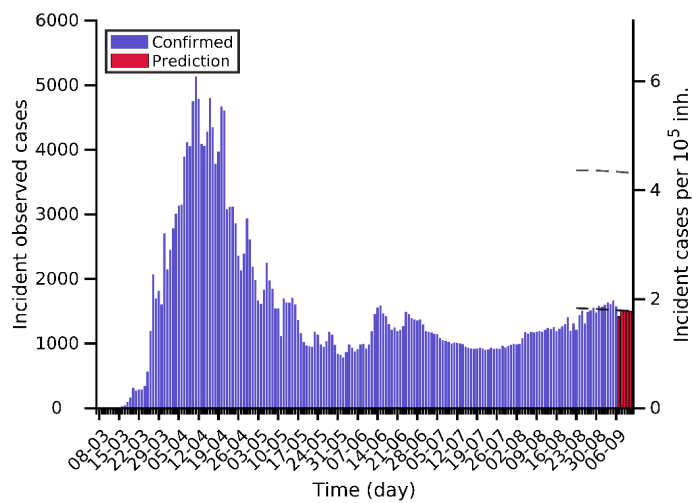


Turkey 06-09-2020. Pop: 84.3M. Cumulative incidence: 332/10⁵

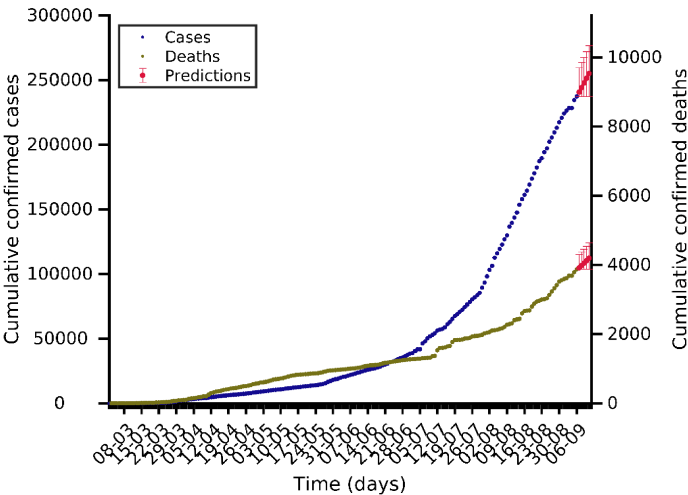


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	281225 (+1419)	[279806 - 282897]
09-09-2020	284246 (+1509)	[282509 - 285983]
11-09-2020	287256 (+1503)	[285381 - 289130]

Current indicators		
A_{14}	EPG	CFR
26	27	3.36 %

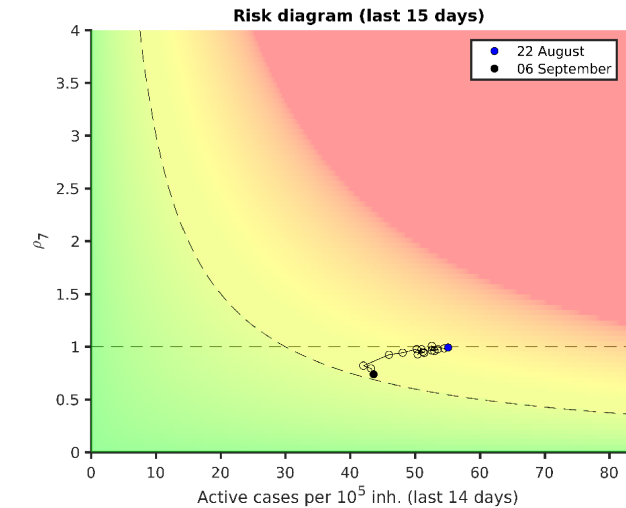
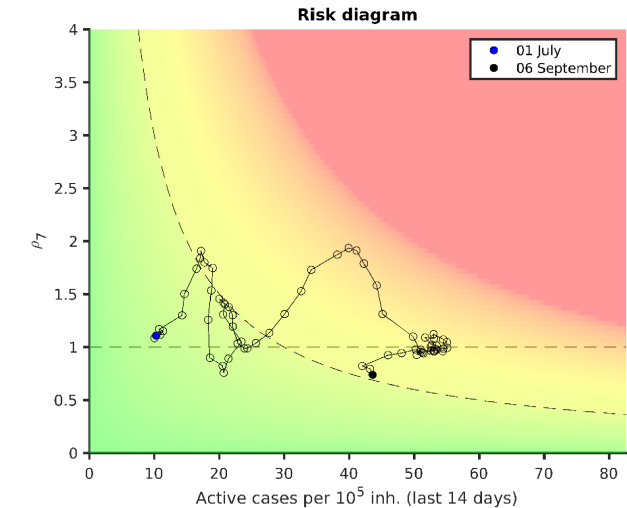
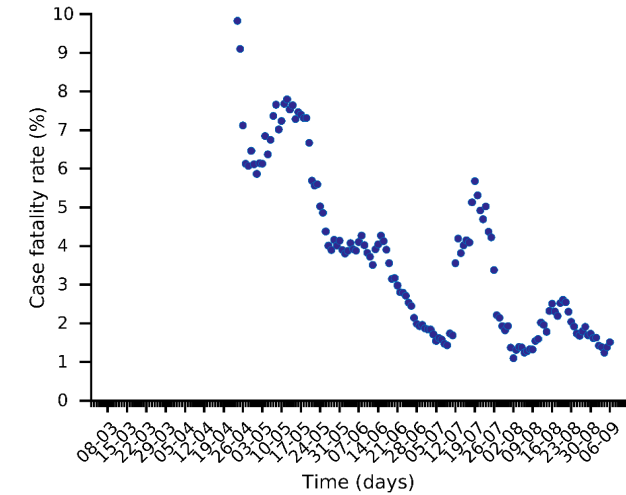
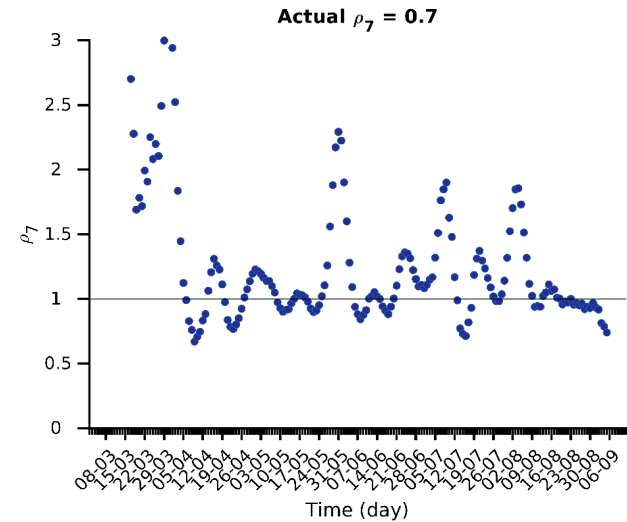
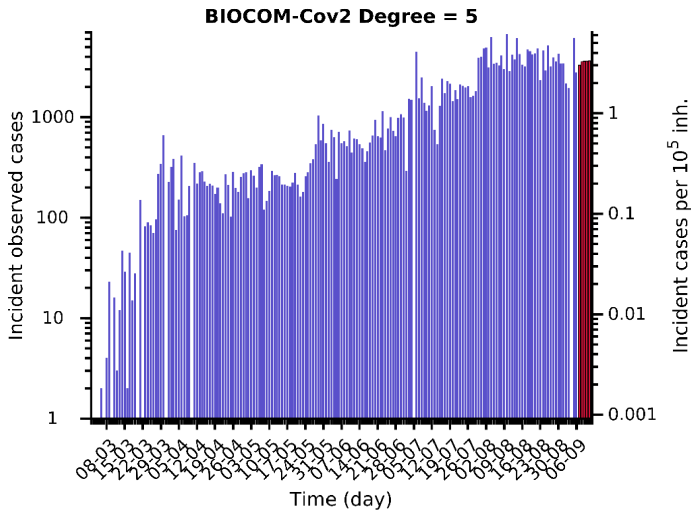
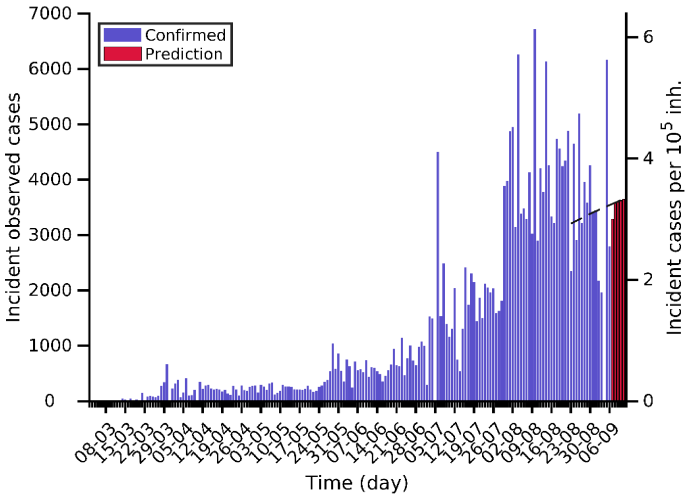


Philippines 06-09-2020. Pop: 109.6M. Cumulative incidence: 217/10⁵

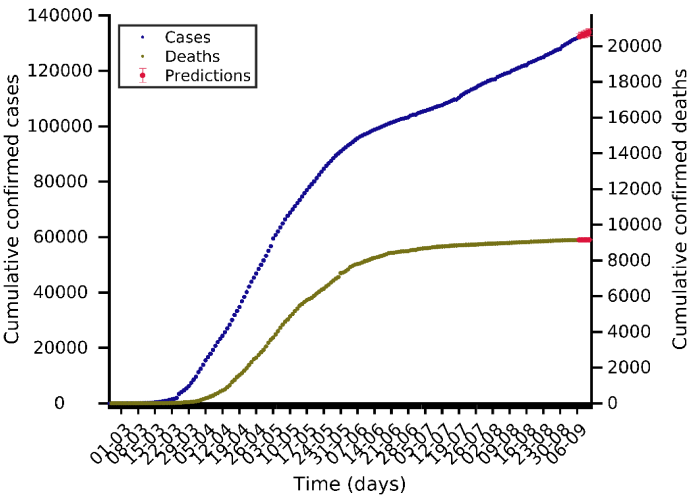


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	240652 (+3287)	[237365 - 259605]
09-09-2020	247842 (+3605)	[237365 - 267605]
11-09-2020	255113 (+3646)	[237365 - 276662]

Current indicators		
A_{14}	EPG	CFR
44	32	1.51 %

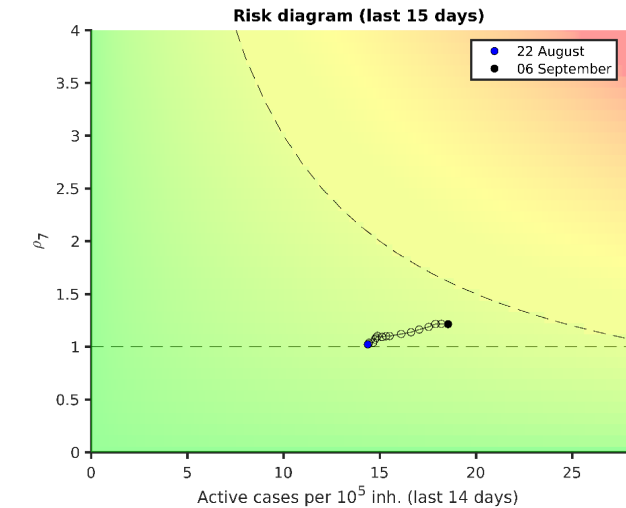
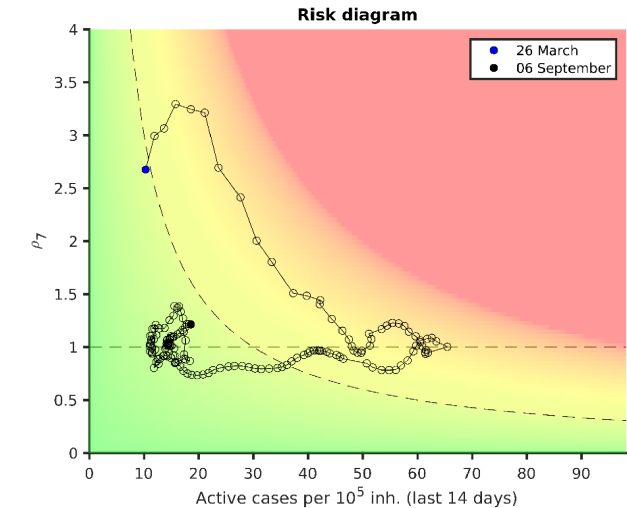
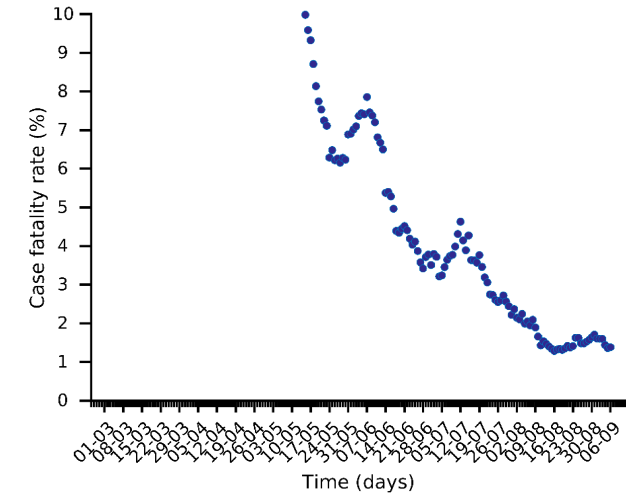
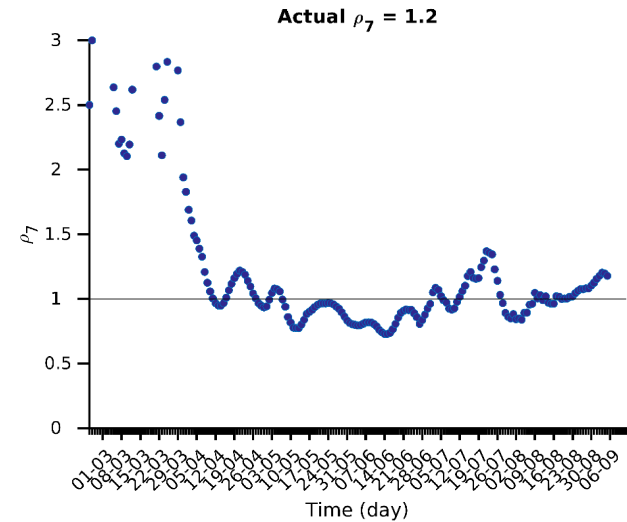
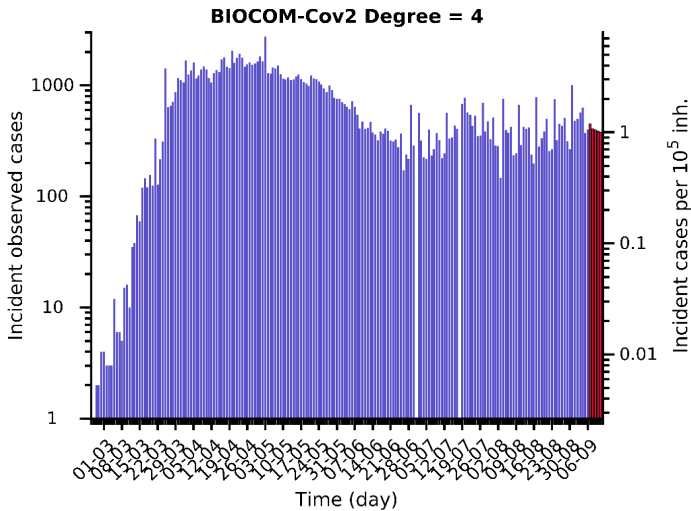
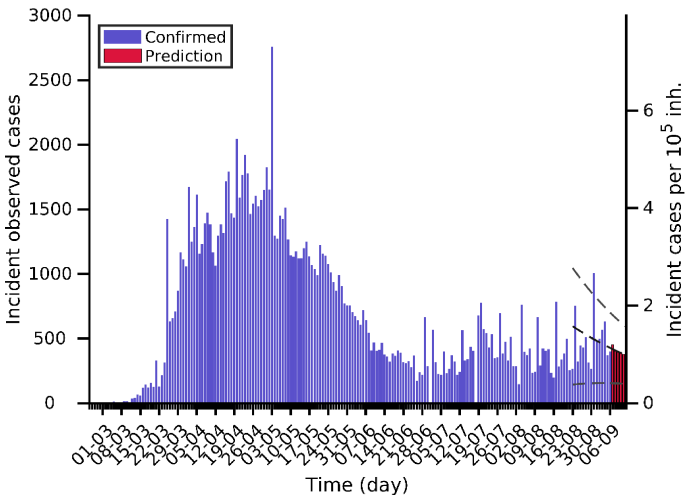


Canada 06-09-2020. Pop: 37.7M. Cumulative incidence: 349/10⁵

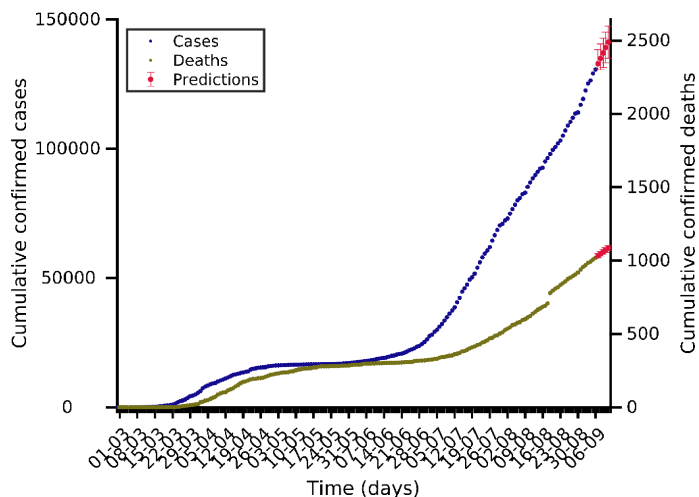


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	132347 (+452)	[131895 - 133484]
09-09-2020	133153 (+398)	[131979 - 134327]
11-09-2020	133920 (+379)	[132673 - 135166]

Current indicators		
A_{14}	EPG	CFR
19	22	1.38 %

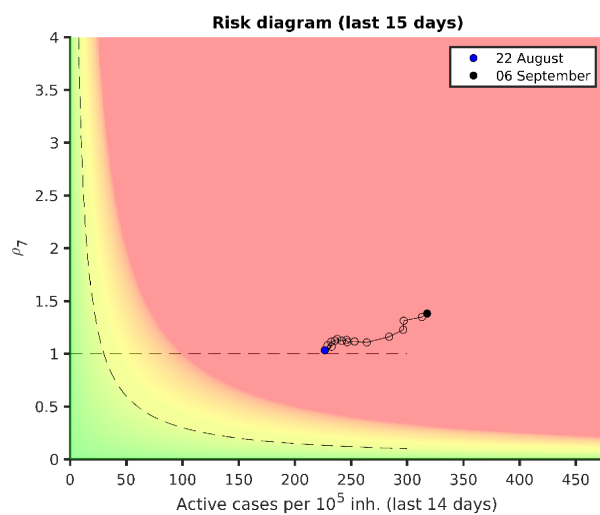
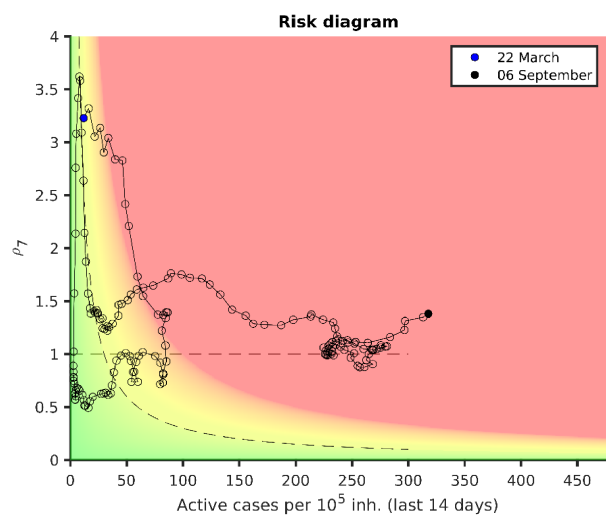
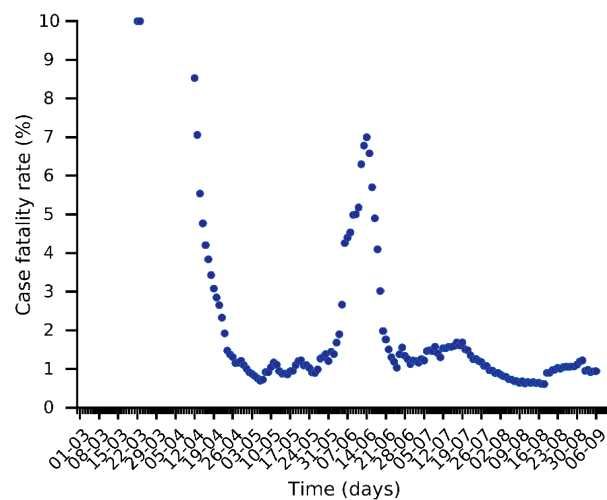
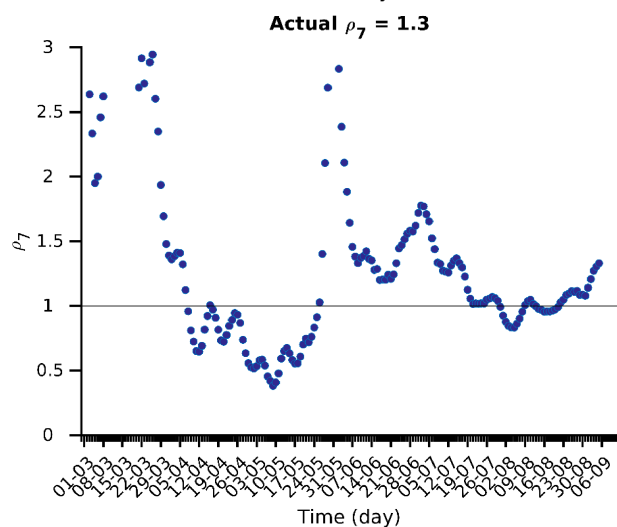
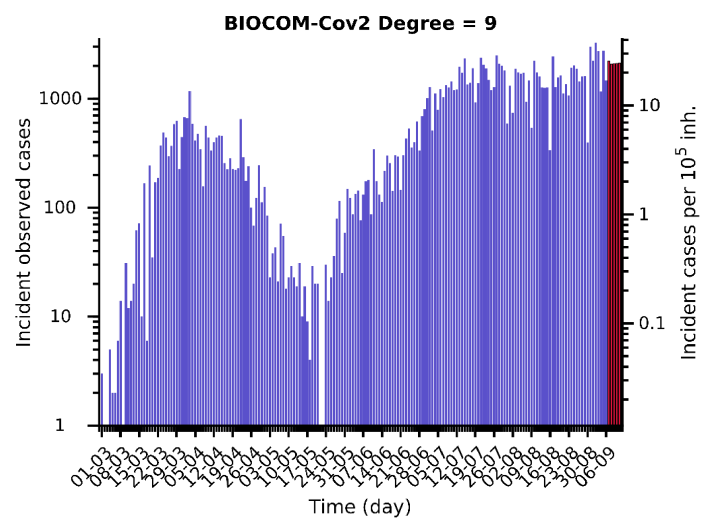
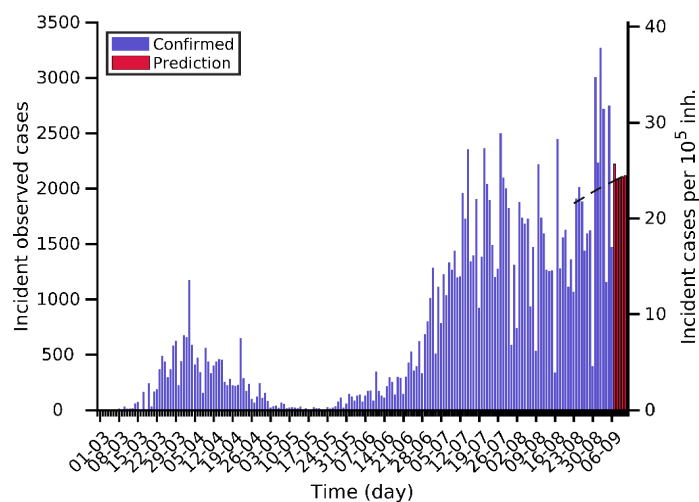


Israel 06-09-2020. Pop: 8.7M. Cumulative incidence: 1509/10⁵

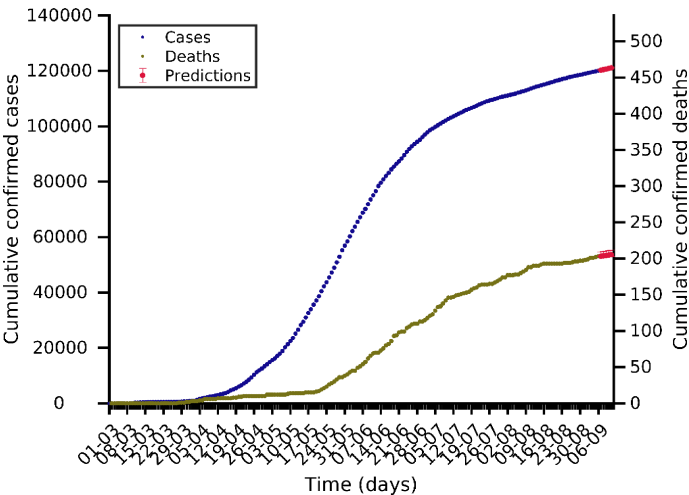


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	132866 (+2222)	[130644 - 138343]
09-09-2020	137048 (+2097)	[131336 - 142759]
11-09-2020	141274 (+2119)	[135046 - 147503]

Current indicators		
A_{14}	EPG	CFR
318	423	0.94 %

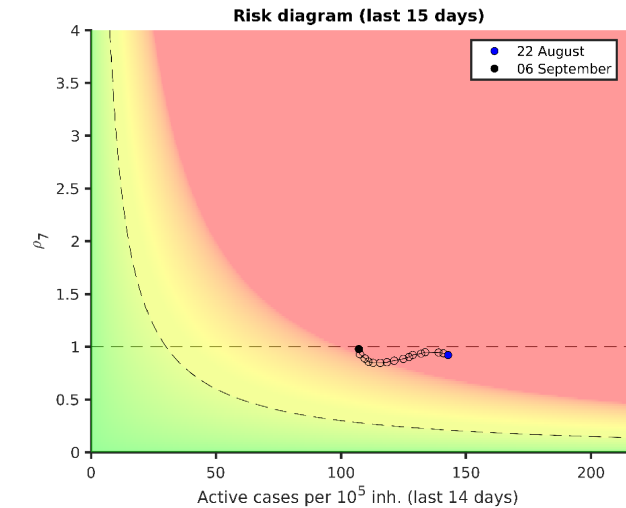
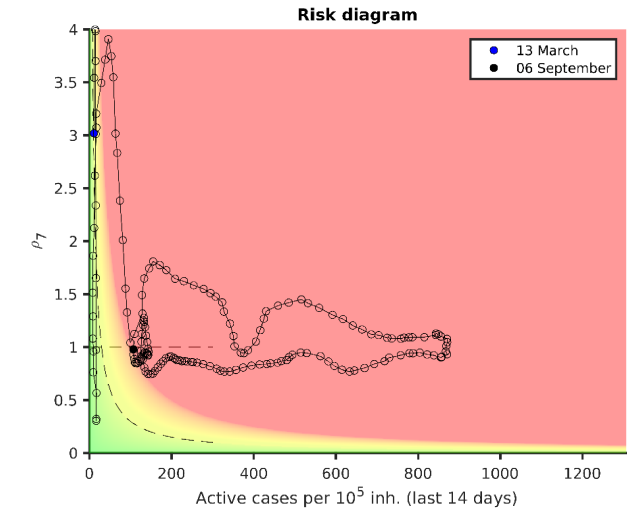
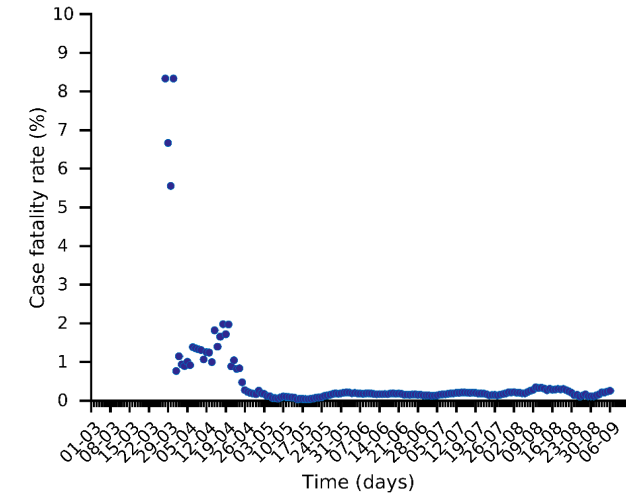
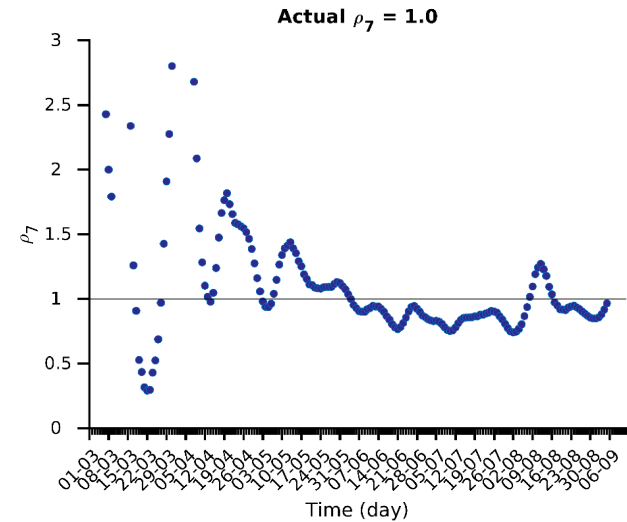
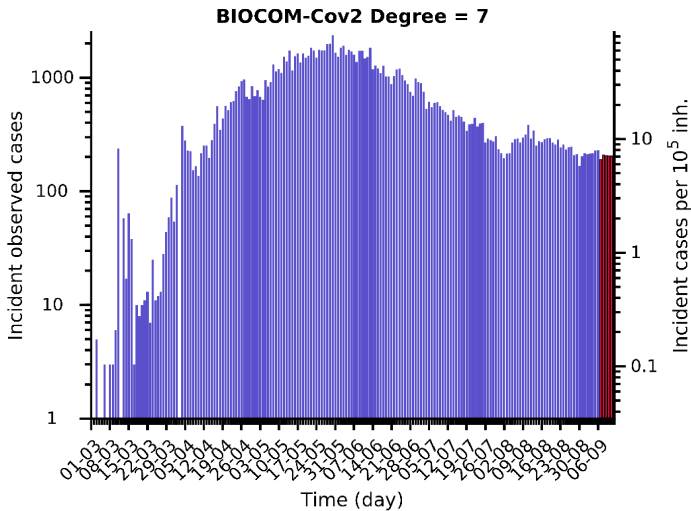
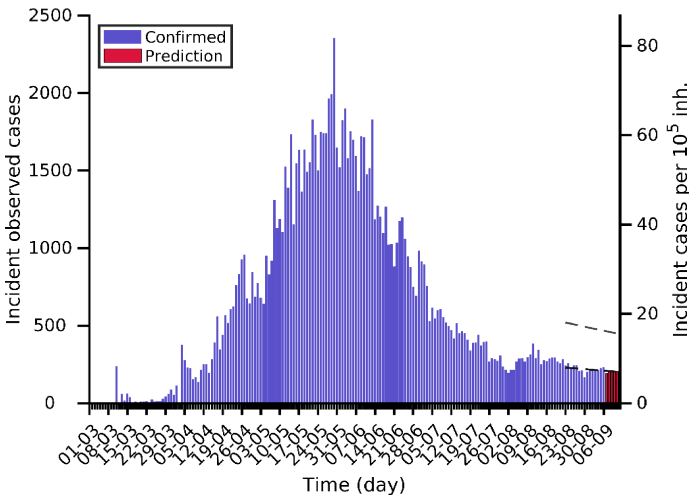


Qatar 06-09-2020. Pop: 2.9M. Cumulative incidence: 4168/10⁵

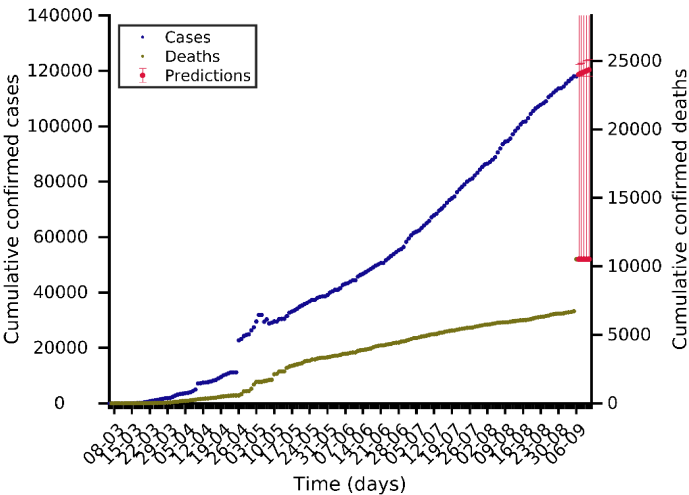


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	120286 (+191)	[120095 - 120531]
09-09-2020	120700 (+206)	[120445 - 120954]
11-09-2020	121108 (+204)	[120835 - 121382]

Current indicators		
A_{14}	EPG	CFR
107	103	0.25 %

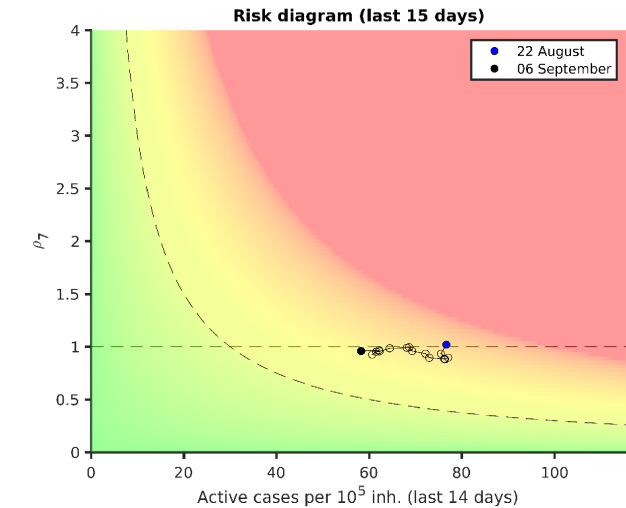
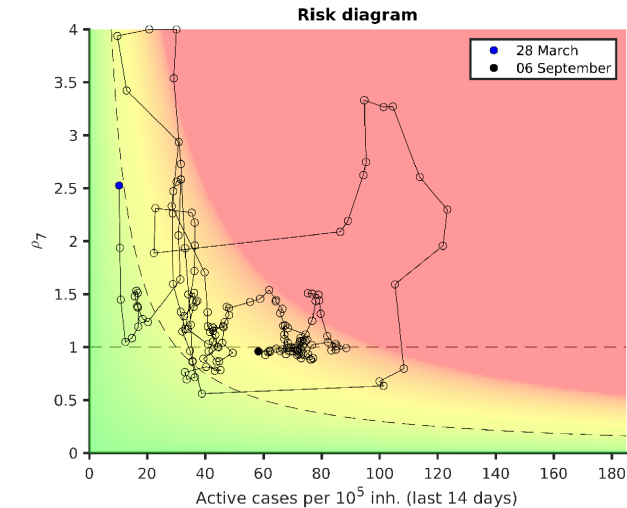
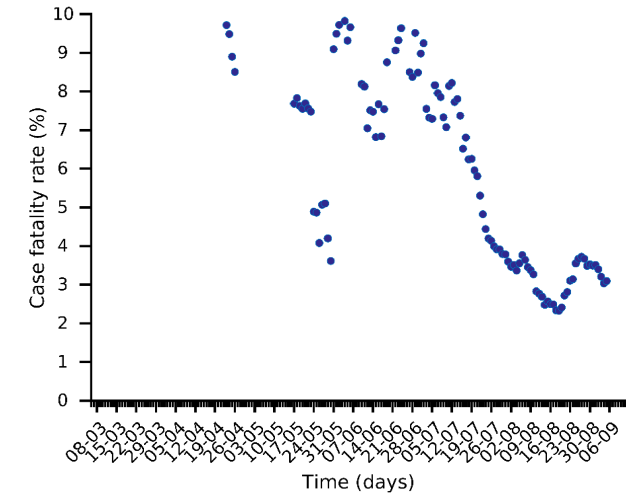
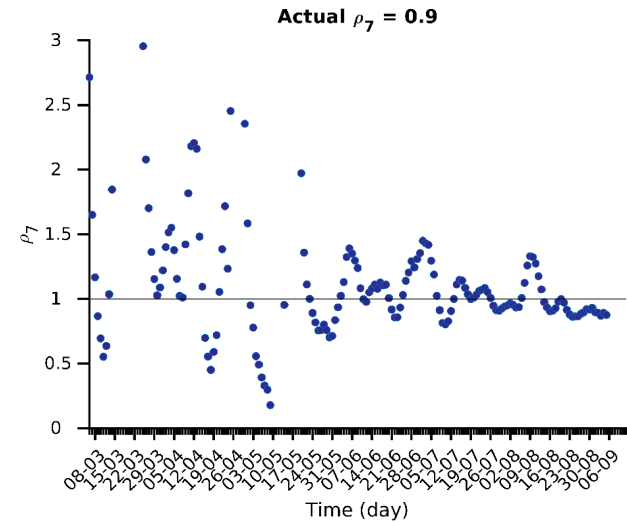
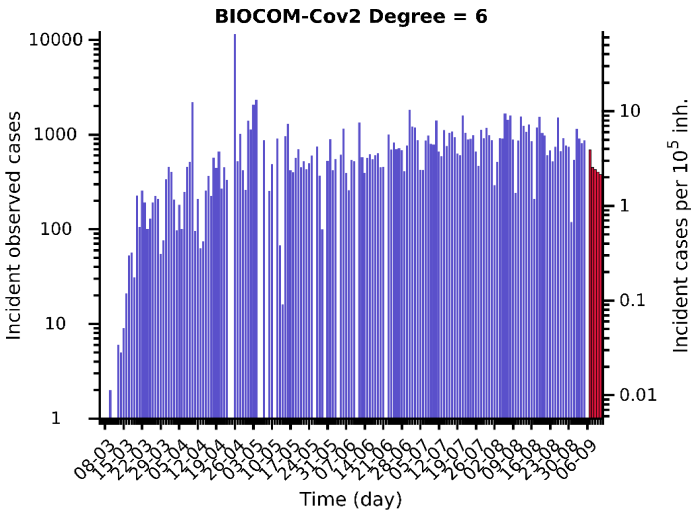
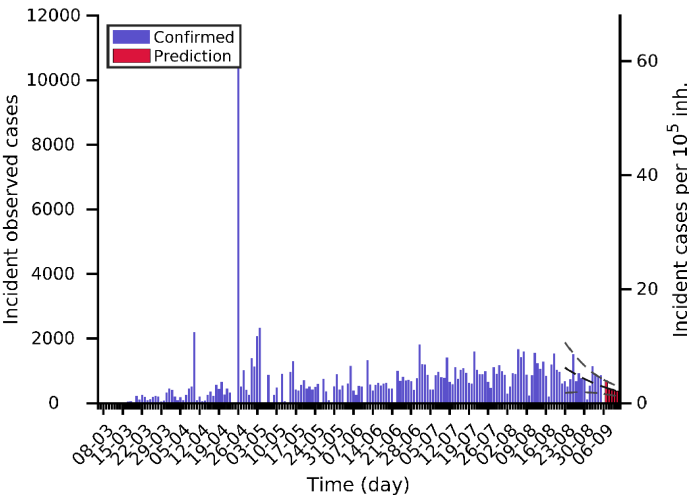


Ecuador 06-09-2020. Pop: 17.6M. Cumulative incidence: 669/10⁵

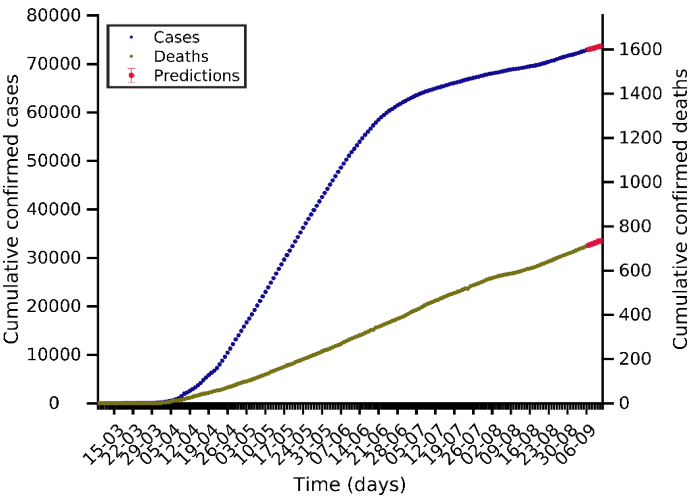


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	118735 (+690)	[118045 - 122245]
09-09-2020	119611 (+425)	[118045 - 123208]
11-09-2020	120389 (+378)	[118045 - 124141]

Current indicators		
A ₁₄	EPG	CFR
58	51	10.00 %

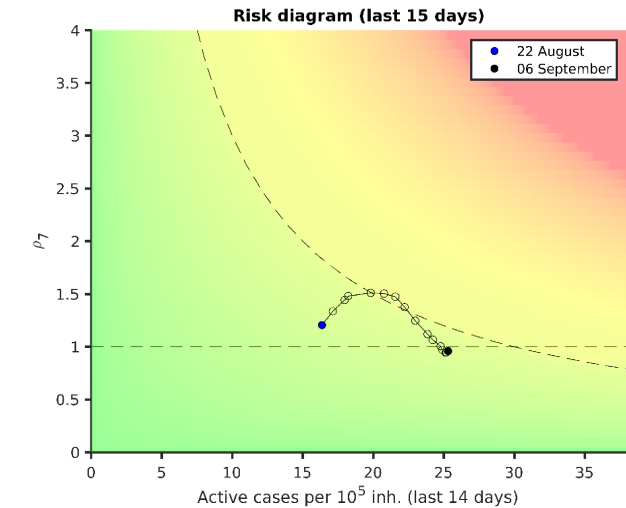
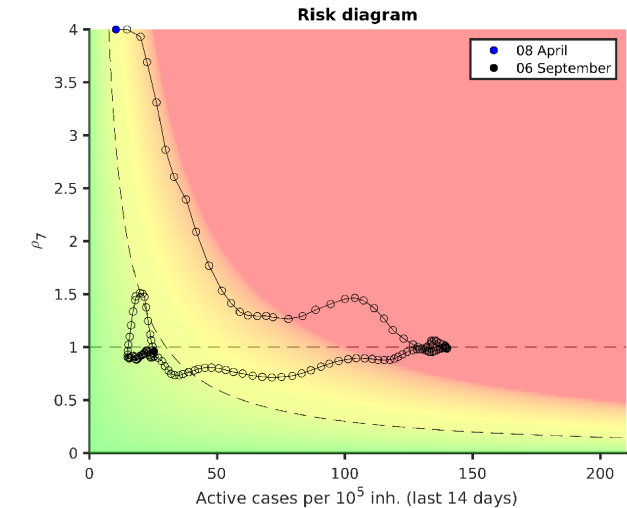
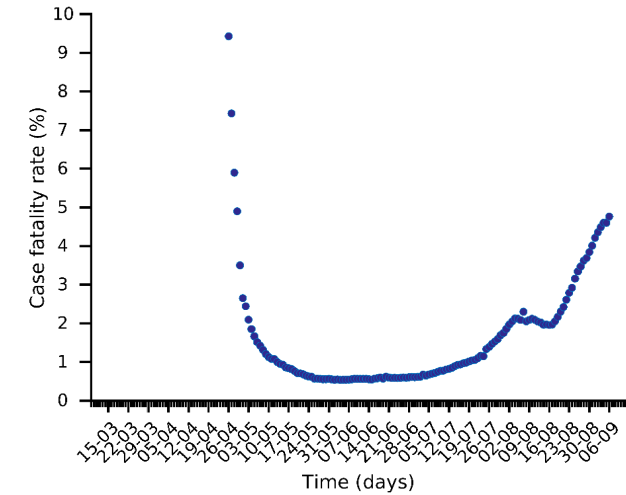
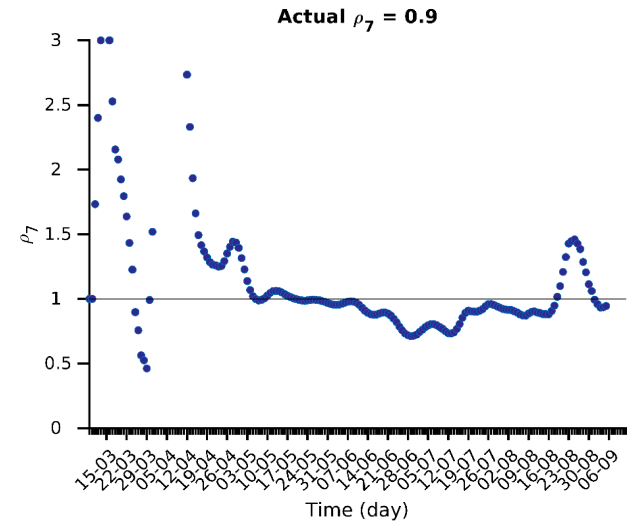
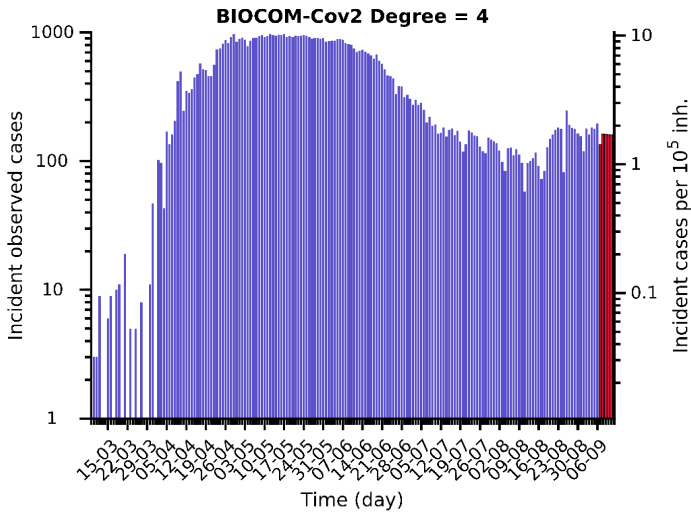
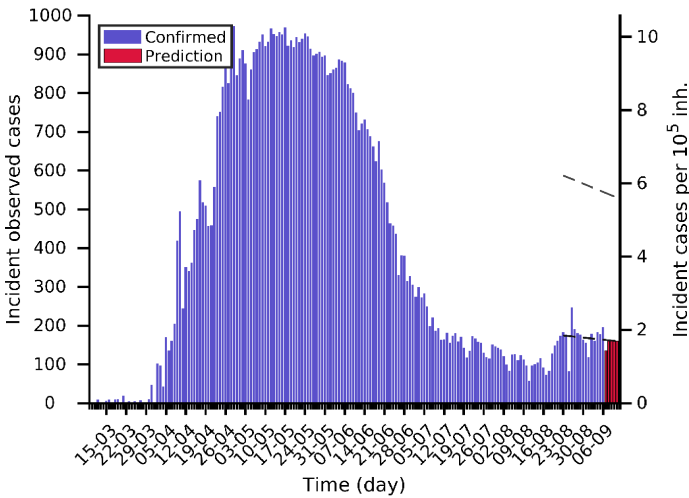


Belarus 06-09-2020. Pop: 9.4M. Cumulative incidence: 771/10⁵

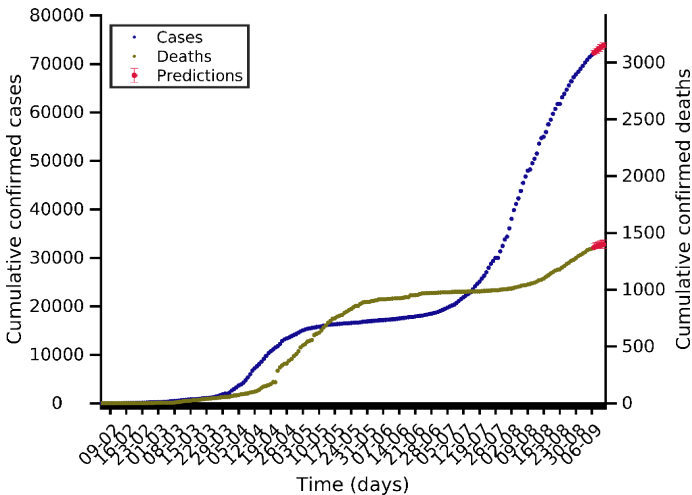


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	72994 (+135)	[72859 - 73291]
09-09-2020	73318 (+162)	[73010 - 73626]
11-09-2020	73639 (+160)	[73308 - 73971]

Current indicators		
A ₁₄	EPG	CFR
25	24	4.76 %

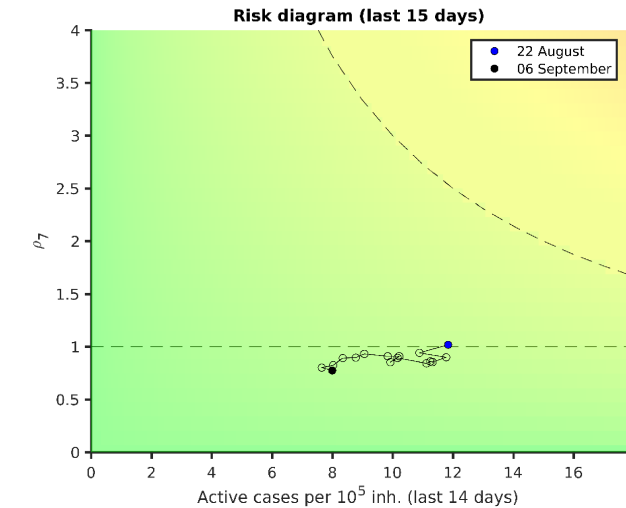
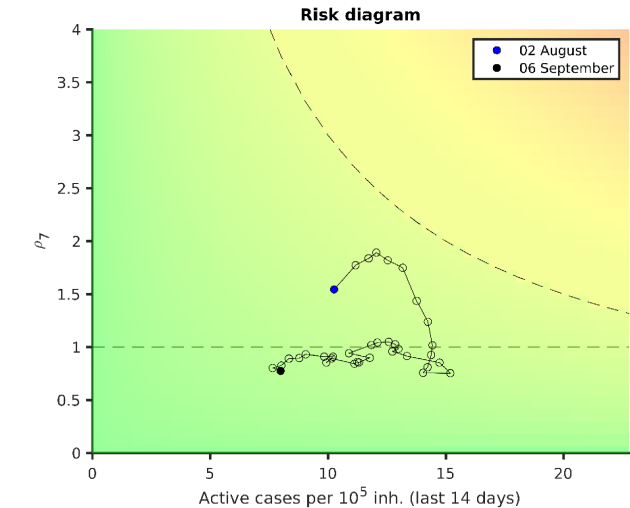
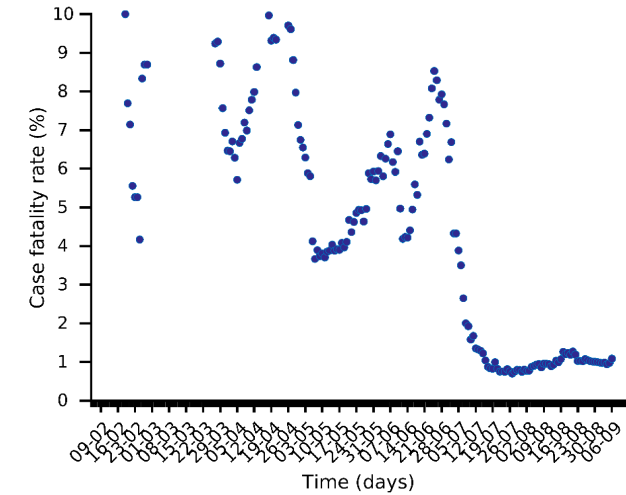
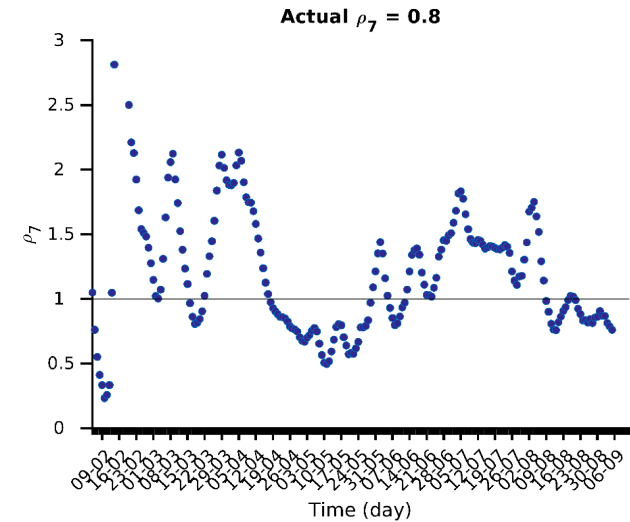
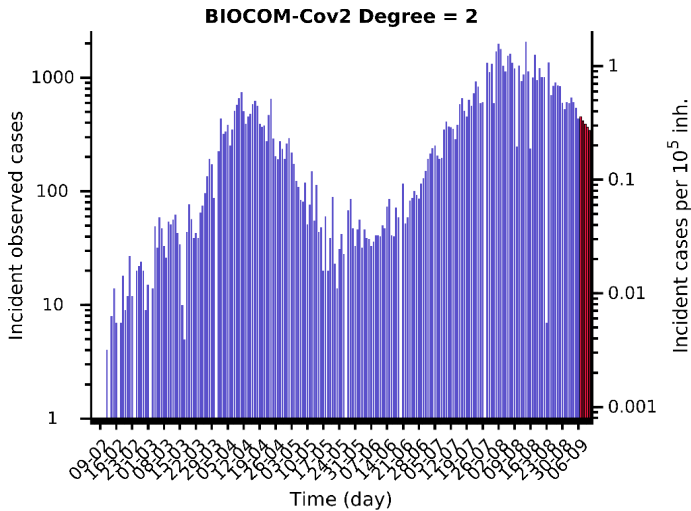
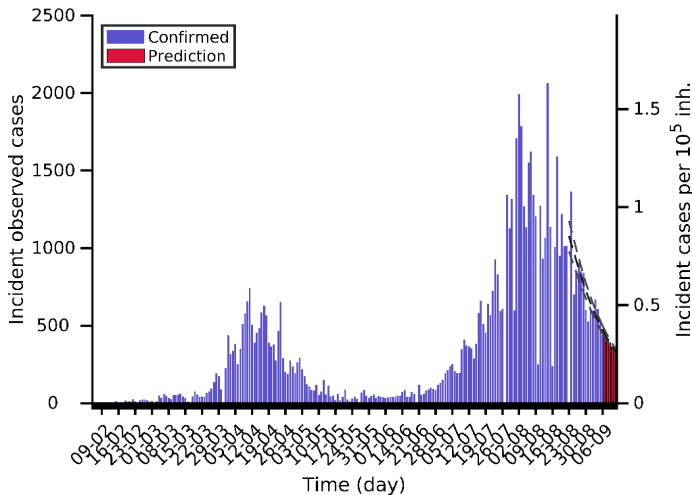


Japan 06-09-2020. Pop: 126.5M. Cumulative incidence: 57/10⁵

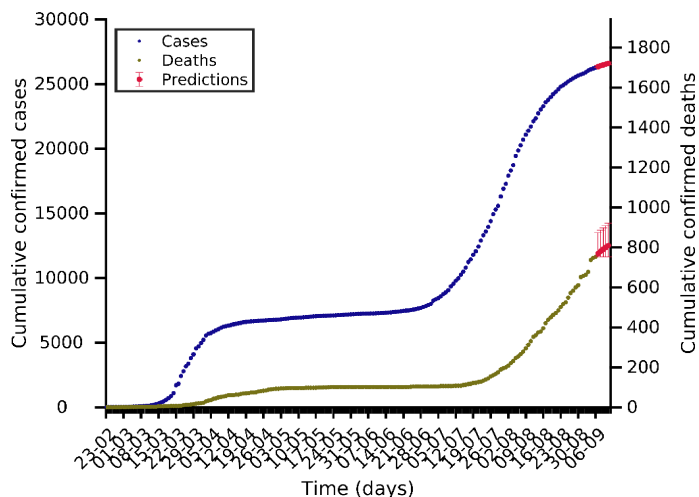


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	72310 (+454)	[71856 - 72802]
09-09-2020	73117 (+390)	[72613 - 73620]
11-09-2020	73825 (+343)	[73301 - 74349]

Current indicators		
A ₁₄	EPG	CFR
8	6	1.08 %

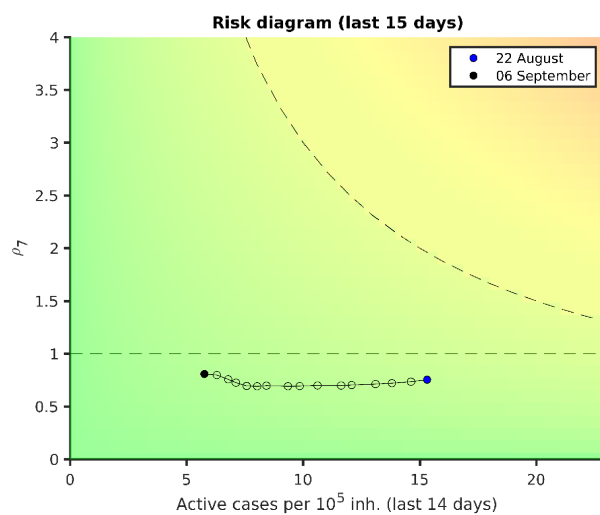
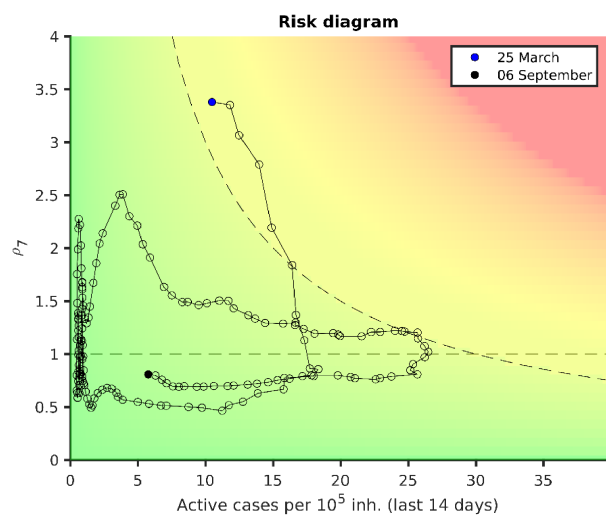
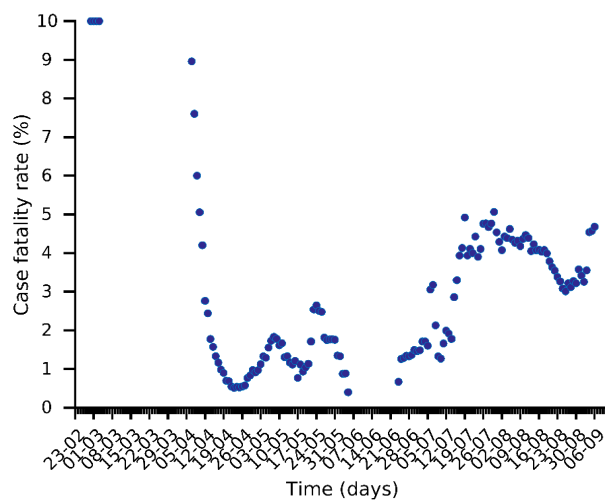
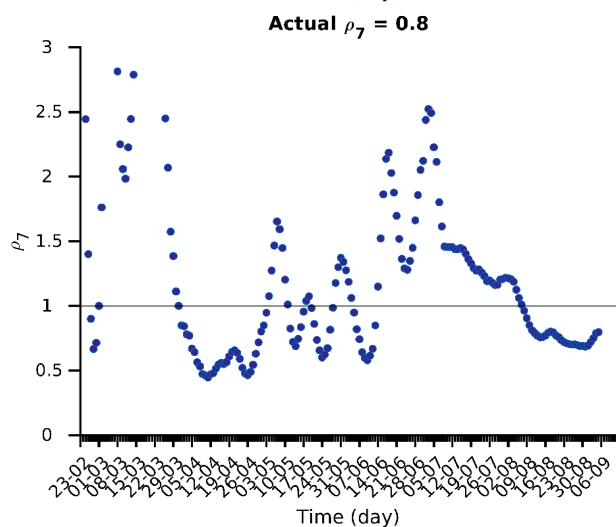
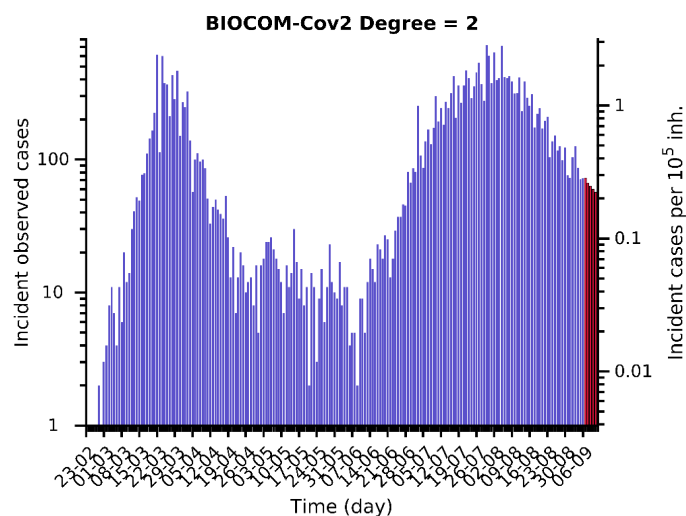
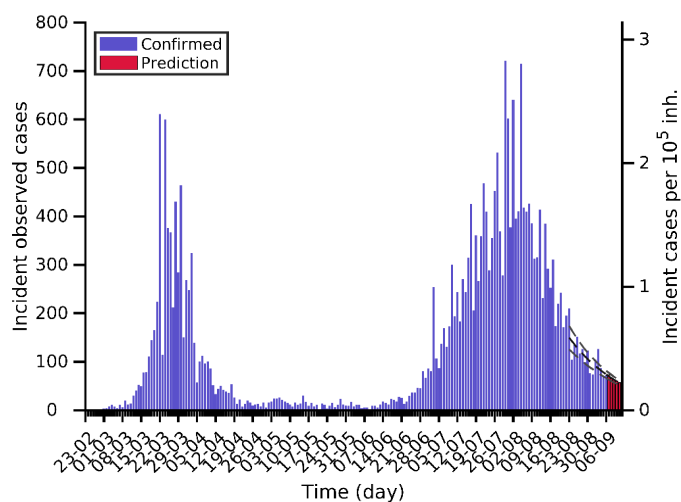


Australia 06-09-2020. Pop: 25.5M. Cumulative incidence: 103/10⁵

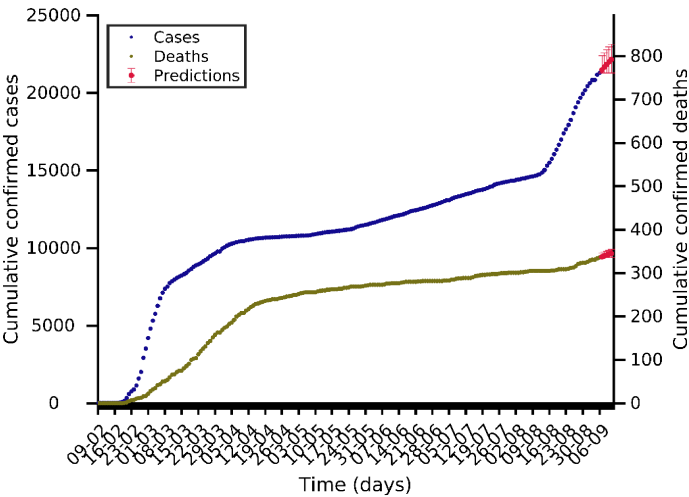


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	26352 (+73)	[26279 - 26450]
09-09-2020	26481 (+63)	[26380 - 26581]
11-09-2020	26597 (+57)	[26492 - 26702]

Current indicators		
A_{14}	EPG	CFR
6	5	4.68 %

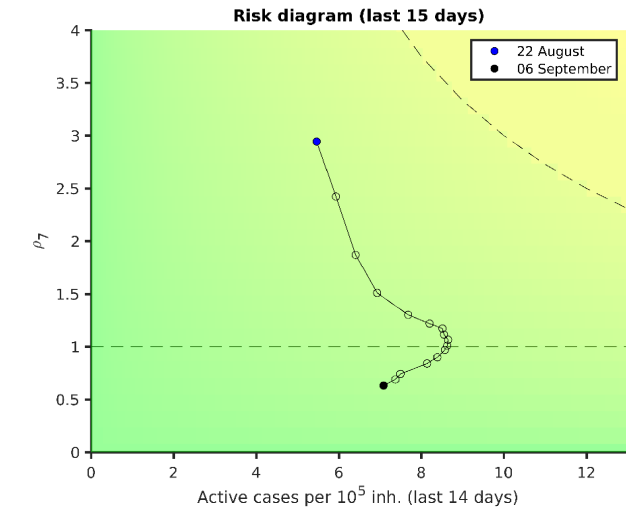
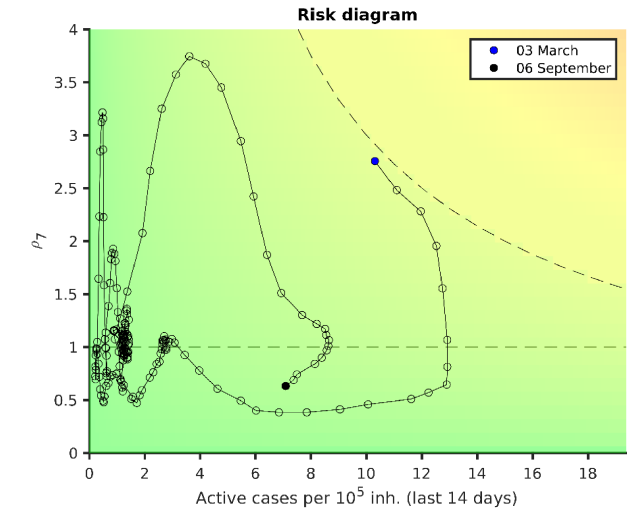
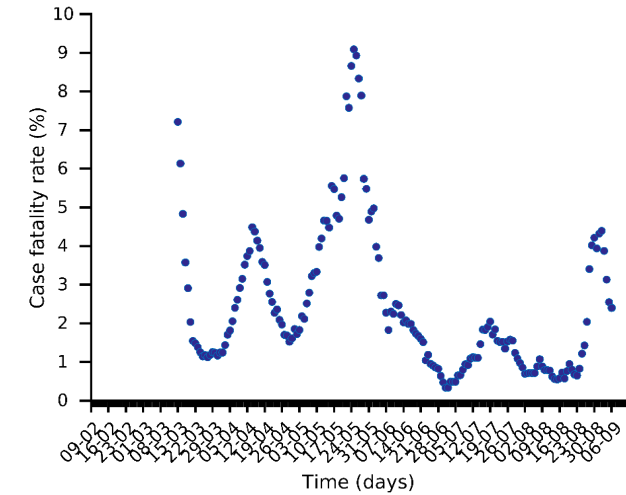
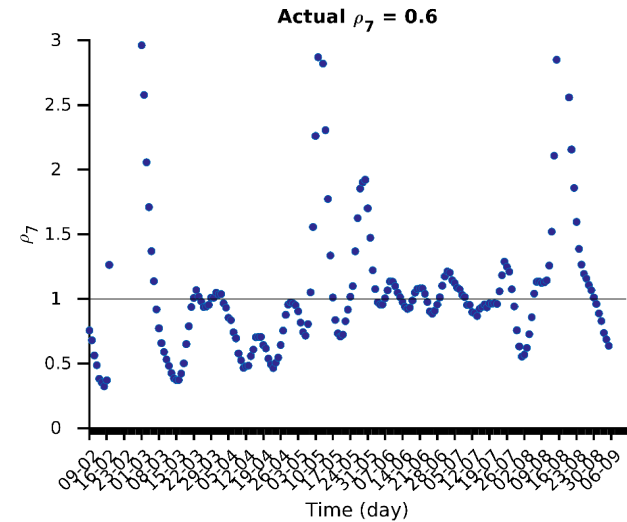
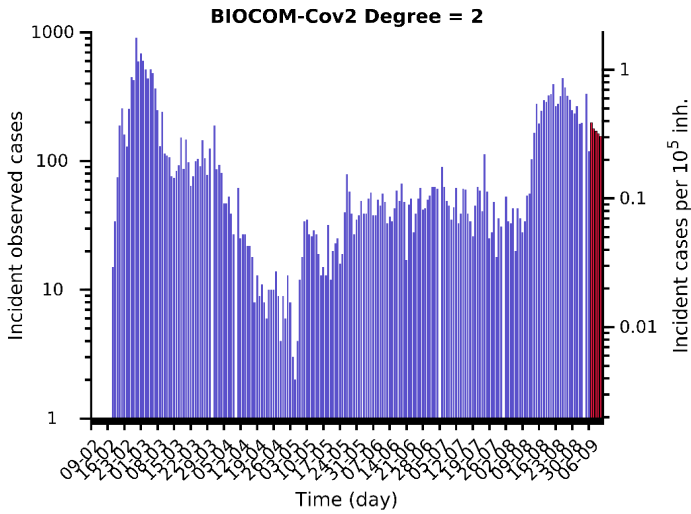
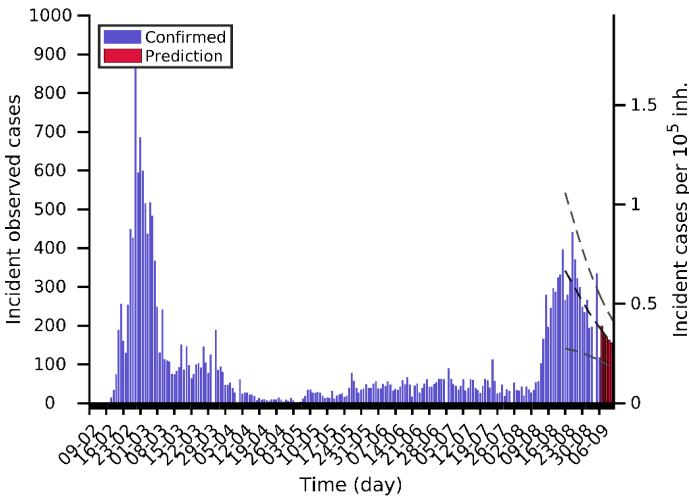


South Korea 06-09-2020. Pop: 51.3M. Cumulative incidence: 42/10⁵

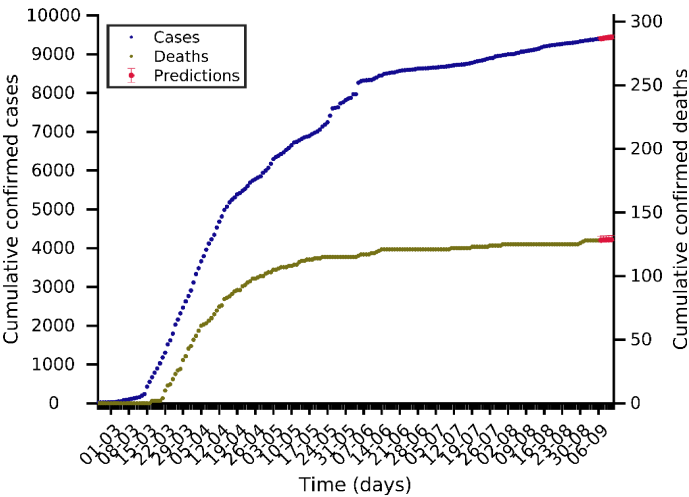


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	21495 (+199)	[21296 - 22405]
09-09-2020	21845 (+171)	[21296 - 22781]
11-09-2020	22165 (+156)	[21296 - 23148]

Current indicators		
A ₁₄	EPG	CFR
7	5	2.40 %

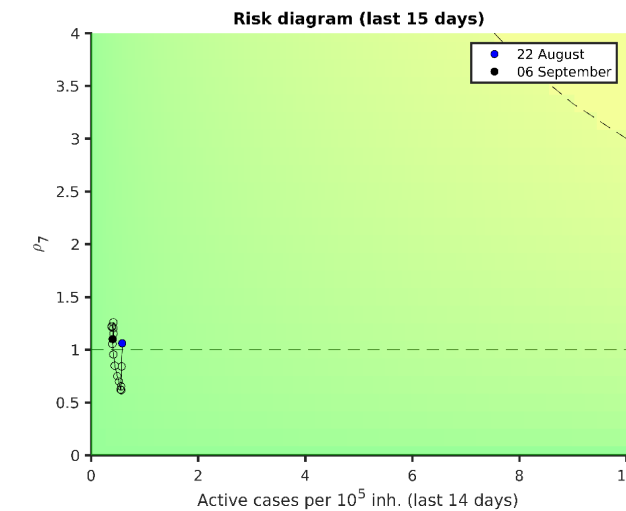
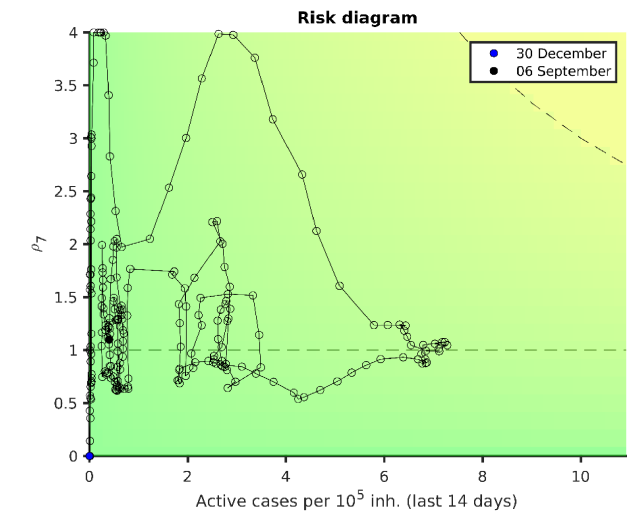
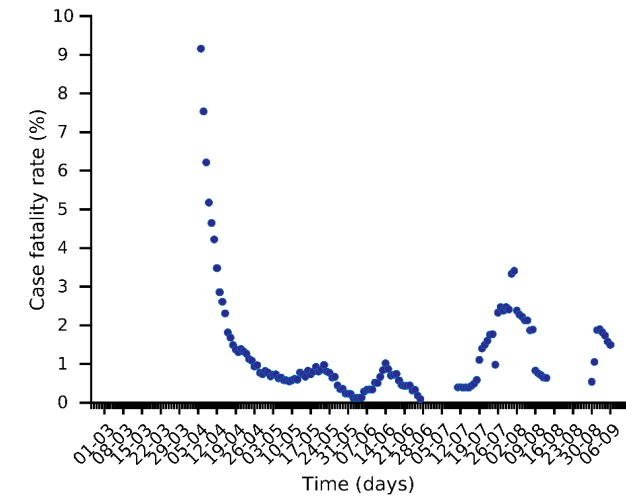
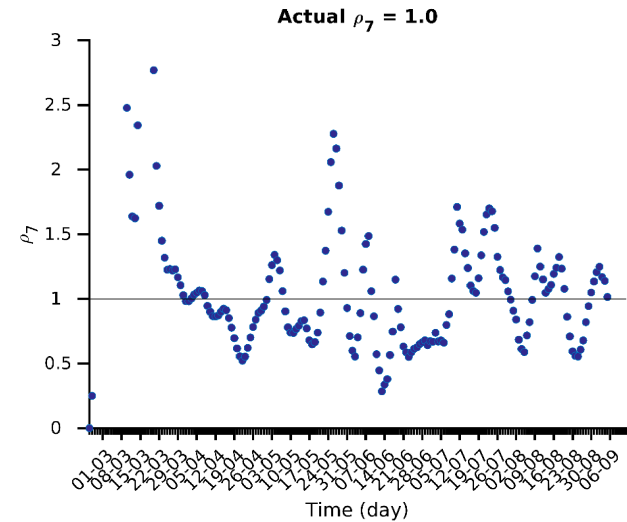
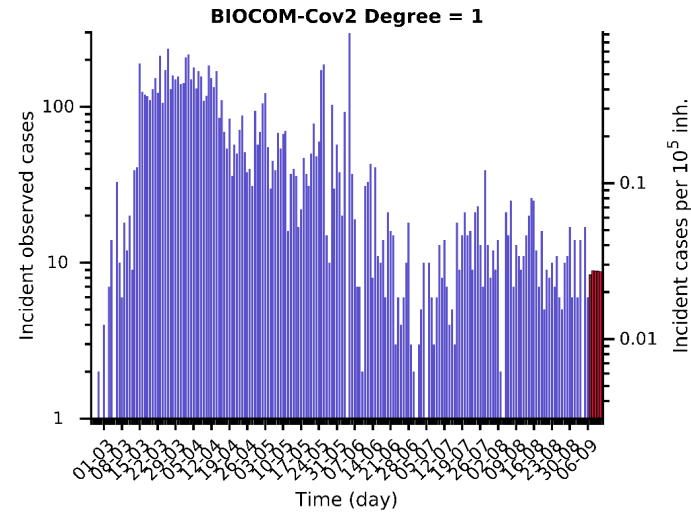
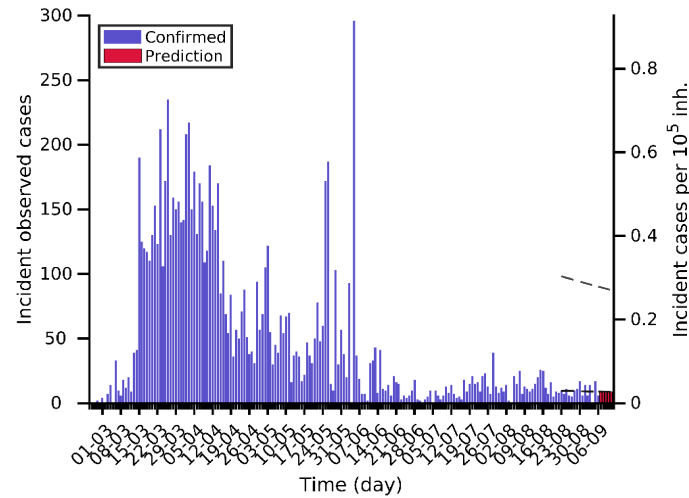


Malaysia 06-09-2020. Pop: 32.4M. Cumulative incidence: 29/10⁵

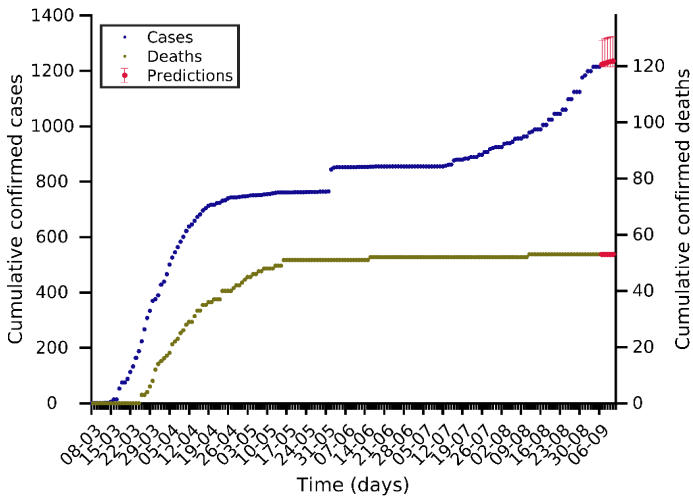


Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	9405 (+8)	[9397 - 9455]
09-09-2020	9423 (+9)	[9397 - 9475]
11-09-2020	9441 (+9)	[9397 - 9497]

Current indicators		
A_{14}	EPG	CFR
0	0	1.49 %

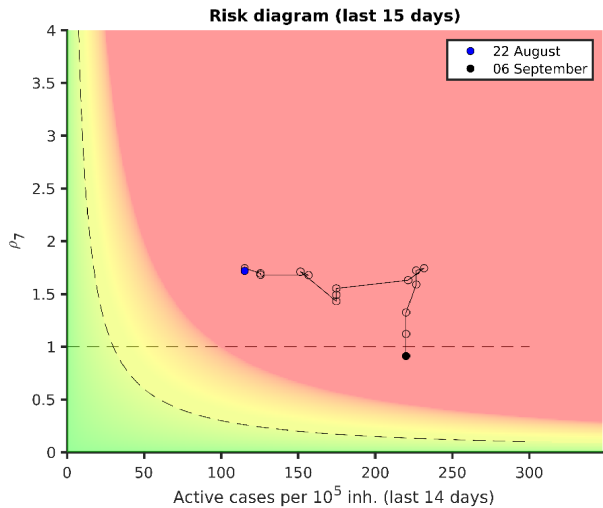
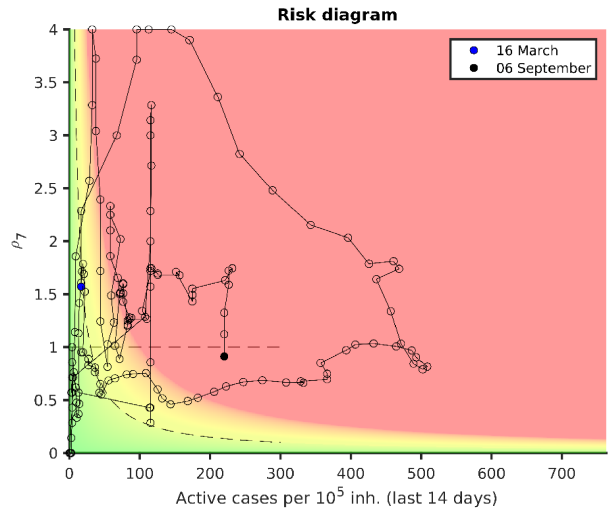
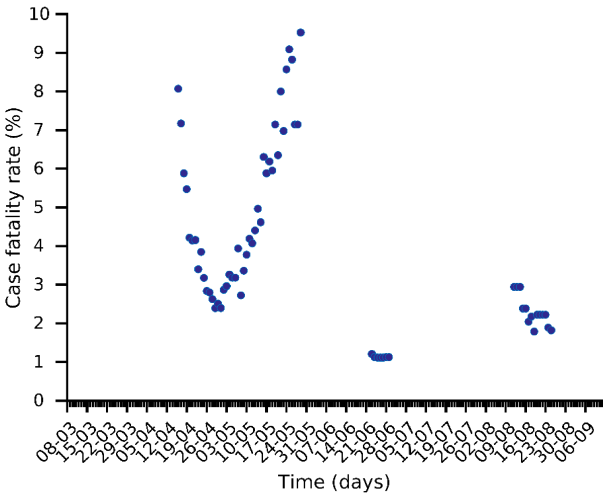
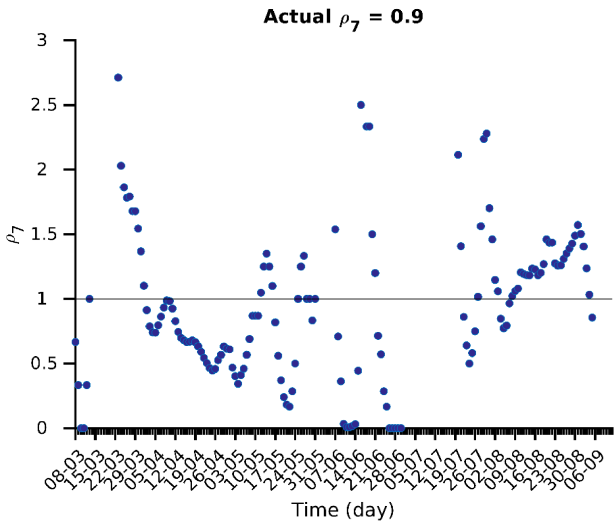
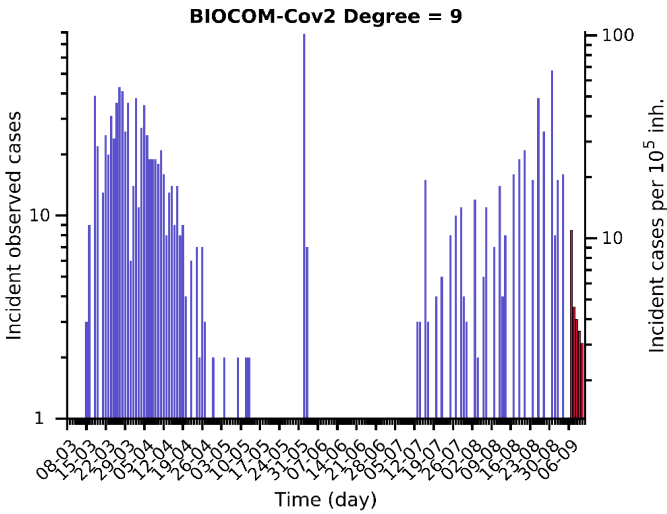
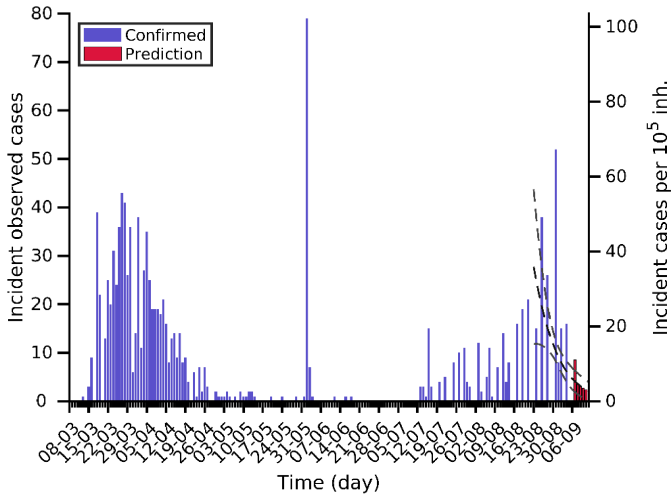


Andorra 06-09-2020. Pop: 0.1M. Cumulative incidence: 1573/10⁵



Predictions for next days		
Day	Number of cases	95% Confidence Interval
07-09-2020	1223 (+8)	[1215 - 1311]
09-09-2020	1230 (+3)	[1215 - 1319]
11-09-2020	1235 (+2)	[1215 - 1325]

Current indicators		
A ₁₄	EPG	CFR
220	188	0.00 %



Methods

Methods

(1) Data source

Data are daily obtained from European Centre for Disease Prevention and Control (ECDC)⁵ and country official sources (when indicated). Daily data comprise, among others: total confirmed cases, total confirmed new cases, total deaths, total new deaths. It must be considered that the report is always providing data from previous day. In the document we use the date at which the datapoint is assumed to belong, i.e., report from 15/03/2020 is giving data from 14/03/2020, the latter being used in the subsequent analysis.

(2) Data processing and plotting

Data are initially processed with Matlab in order to update timeseries, i.e., last datapoints are added to historical sequences. These timeseries are plotted for individual countries and for the UE+EFTA+UK as a whole:

- ✓ Number of cumulative confirmed cases
- ✓ Number of reported new cases
- ✓ Number of cumulative deaths

Then, two indicators are calculated and plotted, too:

- ✓ Case fatality rate: number of cumulative deaths divided by the number of cumulative confirmed cases, and reported as a percentage; it is an indirect indicator of the diagnostic level.
- ✓ ρ : this variable is related with the reproduction number, i.e., with the number of new infections caused by a single case. It is evaluated as follows for the day before last report ($t-1$):

$$\rho(t-1) = \frac{N_{new}(t) + N_{new}(t-1) + N_{new}(t-2)}{N_{new}(t-5) + N_{new}(t-6) + N_{new}(t-7)}$$

where $N_{new}(t)$ is the number of new confirmed cases at day t . Then, we calculate a 7-day moving average (ρ_7) so that noise is reduced and trends become clearer.

(3) Classification of countries according to their epidemic level: the scale Biocom-Cov

Countries are assigned a degree in the discrete Biocom-Cov scale, which aims to facilitate a simple way of assessing the situation of the country. It is based on the level of daily new cases per 100,000 inhabitants as follows:

Pandemic degree	Daily new incident cases per 10 ⁵ inh.
0	0
1	0-0.1
2	0.1-0.5
3	0.5-1.25
4	1.25-2
5	2-3
6	3-5
7	5-8
8	8-14
9	>14

⁵ <https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases>

(4) Fitting a mathematical model to data

Previous studies have shown that Gompertz model⁶ correctly describes the Covid-19 epidemic in all analysed countries. It is an empirical model that starts with an exponential growth but that gradually decreases its specific growth rate. Therefore, it is adequate for describing an epidemic wave that is characterized by an initial exponential growth but a progressive decrease in spreading velocity provided that appropriate control measures are applied. Once in the tail, predictions work but the meaning of parameters is lost.

Gompertz model is described by the equation:

$$N(t) = K e^{-\ln\left(\frac{K}{N_0}\right) \cdot e^{-a \cdot (t-t_0)}}$$

where $N(t)$ is the cumulated number of confirmed cases at t (in days), and N_0 is the number of cumulated cases the day at day t_0 . The model has two parameters:

- ✓ a is the velocity at which specific spreading rate is slowing down;
- ✓ K is the expected final number of cumulated cases at the end of the epidemic.

This model is fitted to reported cumulative cases of the UE and of countries that accomplish two criteria: 4 or more consecutive days with more than 100 cumulated cases, and at least one datapoint over 200 cases. Day t_0 is chosen as that one at which $N(t)$ overpasses 100 cases. If more than 15 datapoints that accomplish the stated criteria are available, only the last 15 points are used. The fitting is done using Matlab's Curve Fitting package with Nonlinear Least Squares method, which also provides confidence intervals of fitted parameters (a and K) and the R^2 of the fitting. At the initial stages the dynamics is exponential and K cannot be correctly evaluated. In fact, at this stage the most relevant parameter is a .

It is worth to mention that the simplicity of this model and the lack of previous assumptions about the Covid-19 behaviour make it appropriate for universal use, i.e., it can be fitted to any country independently of its socioeconomic context and control strategy. Then, the model is capable of quantifying the observed dynamics in an objective and standard manner and predicting short-term tendencies.

(5) Using the model for predicting short-term tendencies

The model is finally used for a short-term prediction of the evolution of the cumulated number of cases (3-5 days). The confidence interval of predictions is assessed with the Matlab function `predint`, with a 99% confidence level. These predictions are shown in the plots as red dots with corresponding error bar. For series longer than 9 timepoints, last 3 points are weighted in the fitting so that changes in tendencies are well captured by the model.

(6) Estimating non-diagnosed cases

Lethality of Covid-19 has been estimated at around 1 % for Republic of Korea and the Diamond Princess cruise. Besides, median duration of viral shedding after Covid-19 onset has been estimated at 18.5 days for non-survivors⁷ in a retrospective study in Wuhan. These data allow for an estimation of total number of cases, considering that the number of deaths at certain moment should be about 1 % of total cases 18.5 days before. This is valid for estimating cases of countries at stage II, since in stage I the deaths would be mostly

⁶ Madden LV. Quantification of disease progression. *Protection Ecology* 1980; **2**: 159-176.

⁷ Zhou et al., 2020. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *The Lancet*; March 9, doi: 10.1016/S0140-6736(20)30566-3

due to the incidence at the country from which they were imported. We establish a threshold of 50 reported cases before starting this estimation.

Reported deaths are passed through a moving average filter of 5 points in order to smooth tendencies. Then, the corresponding number of cases is found assuming the 1 % lethality. Finally, these cases are distributed between 18 and 19 days before each one.